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ABSTRACT

In recent years the many efforts to individualized instruction have been hampered by a lack of communication among professionals. The Descriptor for Individualized Instruction was developed to facilitate communication. It functions in several ways: 1) as a summary of a single program, 2) as a means of comparison between programs, 3) as a tool to compare an existing program with its projected development and 4) as an aid to program development. The descriptor is a graphic representation which identifies, quantifies and describes the relevant parameters of a program of individualization. The nine components of the descriptor are: objectives, rate, sequence, instructional materials (media), management of information, management of instructional components and program pattern. A preliminary program descriptor is also used to describe the setting for the individualization program. The first edition of the descriptor evolved from an exploration of the literature and consultation with qualified professionals. It was then field tested and revised. Although there is no "hard data" available, the staff feels there is informal evidence that if used properly, the descriptor is both reliable and valid. The field tests were conducted in the areas of mathematics, reading and teacher education. The applicability of the descriptor to other areas is unknown as yet. A copy of the descriptor is included. (JG)

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Descriptor for Individualized Instruction

DEVELOPMENT PROCEDURES & RESULTS

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I. INTRODUCTION

PURPOSE OF THE STUDY

Individualization of instruction is a goal sought by educators at many levels and in many educational institutions. Public schools, teachers and administrators, research and development centers, and commercial publishers continue to seek ways to improve the efforts of teachers to serve the needs of individual learners. Through the Sixties and into the Seventies, there have been so many efforts to individualize that simple categorization of programs is impossible and probably undesirable. Currently a wide range of instructional designs is identified as individualized instruction. There are such nationally known programs as IPI, PLAN, and IGE but these are recognized both for supporting functions and for their individualizing procedures and techniques. These three programs, however, represent but a small part of the total national effort to individualize instruction.

Progress in the movement toward increased individualization has been hampered by an inability to communicate intent. Among professionals this inability to communicate ideas about individualization of instruction has many implications. Members of instructional teams are hampered in their efforts to conceptualize program intent and implement a coordinated instructional team effort. Classroom teachers are not acquainted with the terminology which effectively expresses their needs and instructional concerns. Researchers do not have the terminology that they can use to construct hypotheses which have meaning to other professionals. Developers are not fully aware of the intentions their products are to serve. Observers cannot report clearly their impressions about functioning programs from which they or others may wish to borrow. Commercial publishers do not provide the materials required for supporting individualizing instruction. Administrators have few bases on which to make judgments concerning either individualizing goals they seek for their schools or assessment of the progress being made toward individualization by the schools for which they are responsible. To serve these communication needs, the Descriptor for Individualized Instruction has been developed.

FUNCTIONS OF THE DESCRIPTOR FOR INDIVIDUALIZED INSTRUCTION

The Descriptor is designed to provide a graphic portrayal of individualized instructional programs in order to serve several purposes. It can be used to analyze a single program as it is presented in associated literature, as it is described orally by teachers and administrator/supervisors responsible for the operation of the program, as it is reported through observation of the program in use with learners, or described through a combination of these means. The program described may be functioning presently or envisioned as an ideal program which is to be developed.

1. The Descriptor as a summary of a single program. A graphic description of a single program serves those persons most directly involved in implementing the program with a common understanding of the intent and nature of the individualization process. It provides a means of observing the program over time as a faculty and staff continue development and implementation. It permits review of a program in a given school as a prelude to its adaptation to serve different learners within that school. It serves also to report to outsiders the individualizing characteristics of a given program.

2. The Descriptor as the means of making a comparison of several programs. A given set of materials functioning in different school settings with different staff as instructors may take on different dimensions. The Descriptor is designed to facilitate useful comparisons among different settings. It is equally useful in identifying the notable variations among differing programs as they are functioning with learners.

3. The Descriptor as a tool for making comparisons of programs and projected development efforts. Development of individualized programs is an ongoing activity; few schools report a program functioning as fully as it is intended. To improve communication among those who are both responsible for the continued development of the program and serving as teachers in the program, the Descriptor provides pictures of present practice and future goals.

4. The Descriptor as a development instrument. The Descriptor may be used in the beginning efforts to design, develop and implement an individualized program. The Descriptor provides the focus for discussion about the desires of those responsible for the development of the program. During periods of implementation the Descriptor can serve as a kind of check point to determine the extent to which the program is functioning as originally intended. New intents of the program can be incorporated into a new graphic portrait. Thus, both the growth of a program's intention as well as the growth of the program's operating features can be communicated by a series of precise graphic presentations.

5. The Descriptor as a basis for choosing among alternative available programs. Prior to the adoption of an available program, school personnel can utilize the system to make a comparative study of alternative options. These alternative options could in turn be matched to the kind of program that the school personnel would like to use.

ORGANIZATION OF THE REPORT

The project focused on the tasks of defining descriptors of individualized instruction, of designing measures of these descriptors and of developing a protocol for observing individualized instruction. Field tests of the instruments and systems were conducted in order to assess the validity and reliability of the measures and to appraise the acceptance of the results of the analysis.

The purpose of the study was the development of a procedure which may be used to identify, quantify, and summarize significant dimensions of program individualization. A comprehensive Descriptor was developed within which an individualized program can be described in brief, graphic form. The system includes data on many dimensions of individualization in a form which facilitates their interpretation. A primary objective of the proposed development effort was to make the Descriptor accessible to the school and university personnel who are directly concerned with the nature and quality of instruction.

This report and its companion report, The User's Manual: Descriptor for Individualized Instruction, relate the steps in the development of the Descriptor and provide guidelines for the application of the completed Descriptor. This volume describes the process by which the Descriptor was developed, including the nature and extent of input into the process from a variety of sources, the application of early versions of the Descriptor and insights obtained by the WCAII staff from the applications. The five sections of this report reflect the phases of the research effort which culminated in a comprehensive system for describing individualized programs.

Development of Descriptor and Data Collection Techniques. This section identifies the steps which contributed to the development of the Descriptor. Sources of input to this process included an examination of the literature related to individualization. Consultation with qualified professionals throughout the process provided feedback related to the accuracy, intelligibility and utility of the developing Descriptor. Instruments measuring activity in each component were devised. These component instruments were field tested prior to the testing of the entire Descriptor.

Field Test Edition of Descriptor. The development process yielded a complete version of the Descriptor which was used in a comprehensive program of field testing. The field test edition included a statement of the rationale for the project and for the selection of components of individualization, a graphic presentation of the components and a complete set of documentation describing components and defining terminology.

Field Testing Procedures. The Descriptor was tested as a complete system in order to evaluate its utility and practicality and to test its acceptability to educators and researchers as a meaningful tool. The choice of program areas for field tests was made to test the system under different environments. The areas of individualized school mathematics, individualized reading and individualized teacher education were designated as representative. In field tests for each of the three areas selected efforts were made to test the application of the comprehensive system in serving alternative purposes. Hence, field tests included: a) straightforward program descriptions; b) comparison analyses between the goals and practices of certain programs and c) use of descriptions and comparison analyses for program development.

Validity and Reliability of Descriptor Use. There was continuing concern for the satisfactory resolution of certain measurement successes and failures. Questions of educational importance and content validity were continuously addressed during the development of the Descriptor. A special reliability study was conducted within a school, using five weeks of classroom observation and two different interview techniques. The experiences of the WCAII staff during the Descriptor development and outcomes of the special study are reported here in order to communicate the current status of the validity and reliability of the Descriptor.

Conclusions from the Field Test. The strategy for applying the system was revised in recognition of the field tests. The field test provided input both into revising the Descriptor and into formulating techniques for applying the Descriptor. The accounts of these processes provide the background for the completed Descriptor and its presentation in the User's Manual.

II. DEVELOPMENT OF THE DESCRIPTOR

INTRODUCTION

The development of the Descriptor[1] has been a lengthy and complex task. Individualization of instruction is a many faceted phenomenon as it exists both in the schools and in the minds of those who hold hopes for its significant contribution to the effectiveness of schools in the future. There is little agreement among educators as to either the nature of the individualizing experience or the characteristics of programs which nurture such experiences.

This lack of consistency was observed by students and faculty participating in a mathematics education seminar in the spring semester of the 1969-70 school year. Early in their efforts to study instructional systems it became evident that communication about what one observed was extremely difficult. To solve this communication problem the group set out to devise a scheme for reporting their observations.

The present research effort is an extension of the early work of the seminar.

So diverse is the domain of individualization that the WCAII staff made an early decision about the importance of looking at the problem from three perspectives: the perspective of experience and theory as revealed through the literature, the perspective of consultants whose experience includes attempts at the implementation of individualization ideas; and the perspective of specific programs as they were observed functioning in classrooms.

From each of the three perspectives, the development staff derived unique benefits. Our early work in the literature dictated a specific and essential limitation of focus and resulted in our identifying those programs which might be associated with systems designs as the major point of utility for the Descriptor. We also recognized that a large set of individualizing efforts may be beyond the scope of a single descriptive instrument. In addition, the literature assisted our selection of the

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[1] Several forms of the Descriptor were developed during the course of the project. Two forms are referred to in this report: the one field tested under the title Descriptor for the Analysis of Individualized Instruction and the one for which the Users Manual was prepared under the title Descriptor for Individualized Instruction.

specific components of the Descriptor and verified the extent to which those components were congruent with school practices in designing individualization of instruction.

Consultants both kept us honest and provided additional ideas appropriate to our task. They constantly reminded us of the subjectivity of our instrumentation and of realities in the school settings and offered many suggestions which encouraged us to continue to address difficult problems.

Finally, programs in schools which were in varying stages of individualization provided the setting we needed first for verification of our component descriptors and ultimately for testing the Descriptor in its totality.

In this section, our utilization of these three sources -- literature, consultants and schools -- is presented. As our work progressed it became apparent that the integration of contributions from all three sources provided a wealth of experience in the process of developing the Descriptor. This section of our report is organized to provide the reader with a sense of the contributions from each of these sources and of the interrelatedness of all three.

EXPLORATION OF THE LITERATURE

Individualization of instruction has received considerable attention in the literature of professional education. The scope and orientation of articles and reports discussing aspects of individualization reflect the diversity of approaches to the topic, as theoreticians and practitioners consider individualization in view of their own academic orientation. In surveying the extensive literature on individualization, the need for establishing a conceptual framework to facilitate communication becomes readily apparent.

The Descriptor for Individualized Instruction was developed and applied in an attempt to integrate the contributions of theoreticians and practitioners into a conceptual scheme useful to both groups in discussing and planning for individualization. It has drawn on a wide variety of sources in an effort to be comprehensive and communicative. This chapter identifies the nature of those resources and suggests their influence on the Descriptor. A comprehensive bibliography offered as an Appendix to this report provides a more complete listing of consulted materials.

In virtually every instance, the writers considering individualization have refrained from either a definition of individualization or a delineation of the scope of individualization in the schools. The WCAII staff has adopted the same convention, avoiding the formulation of a definition of individualization. Rather, our intent at this point is simply to describe.

From its inception, the Descriptor was intended to focus on instructional programs in schools. Early decisions were made to present the Descriptor in the language of the classroom or school and its organizational features. The authors have looked at individualized instruction -- however one may define it -- as a phenomenon designed and intended for implementation in the context of the formal school. Individualization is viewed as a set of practices and operational characteristics taking place in the schools; the task remains to analyze this phenomenon and consider its bases in the disciplines of learning theory, organizational group theory and systems perspectives.

Several literatures were reviewed in developing the Descriptor. First the subject of individual differences in learning as considered from the two distinct perspectives offered by learning theorists and school personnel was examined for insights into variables appropriate for consideration in classroom learning. Second, aspects of instruction and instructional procedures dealt with in a variety of theoretical and

anecdotal reports were reviewed. These sources identified or examined specific features of classroom practices important to individualizing instruction. Finally, taxonomies describing individualizing procedures were studied. These references offered unified conceptualization of instruction as systems of elements.

Individual Differences Examined in Learning Theory and Treated in Educational Practice

Individual differences in learning have generated both academic attempts to place observed phenomena into theoretical perspectives and classroom innovations which involve designing activities to accommodate learners. Several attempts have been made to integrate the results of these disjoint efforts. There is, however, still a gulf between these two efforts and hence between the reports which describe them. This section will cite a few references which either summarize some of the extensive research literature or examine the discrepancies observable between theory and practice.

Proceedings of a conference on learning and individual differences, edited by Gagne (1), addressed the interrelated questions. In what ways may people be expected to differ in their learning? How might these ways be measured as individual differences? The articles examine research findings illuminating individual differences in several types of learning. In generalizing the findings and conclusions of the articles, Melton (2) underscores the need to frame hypotheses about individual differences in constructs of contemporary theories of learning and performance.

In spite of limited generalizable insights from research into individual differences in learning, Gagne (3) has observed that an essential part of learning must come from inside the individual and that hence learning is, by definition, an individual act. While learning is individual, it may occur in the social environment of the school. The history of education may in one sense be regarded as a chronicle of attempts to provide instruction to individuals in a social setting. What is notable about

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1. Robert M. Gagne (Ed.), Learning and Individual Differences, (Columbus, Ohio: Charles E. Merrill Books Inc., 1967).

2. Arthur W. Melton, "Individual Differences and Theoretical Process Variables: General Comments on the Conference," in Robert M. Gagne (Ed.), Learning and Individual Differences, (Columbus, Ohio: Charles E. Merrill Books, Inc., 1967), pp. 238-252.

3. Robert M. Gagne, "Learning Research and Its Implications for Independent Learning," in Robert A. Weisgerber (Ed.), Perspectives in Individualized Learning, (Itasca, Illinois: F. E. Peacock, Inc., 1971), pp. 12-30.

very recent attempts at what is called individual learning is the search for educational techniques to place increasing dependence and responsibility for learning in the hands of the learners. The nongraded school and programmed instruction are cited by Gagne as two examples. Seidel believes that the problems that face researchers in applying learning theories to instructional strategies "require a global view of the information requirements of the instructional system" (p. 41). Cybernetic approaches which assess students' capabilities for instructional strategy selection, relate the aspects of selection to student characteristics, and determine where programs can control the aspects of selection, offer the most promising research leads, he maintains.

Unifying the diverse views of individualized instruction from the perspective of the learner and of the school in which his learning takes place appears to be difficult. Seidel (4) has discussed the problems which arise in determining commonalities in research using the two orientations. The underlying philosophical distinctions are profound, and their consequences for talking about individualization can be seen from an examination of the differences in two national yearbooks on Individualized Instruction, one published by the ASCD in 1964 (5) and the other published by the NSSE in 1962 (6). The NSSE stresses the development of instruction to respond to a variety of learner characteristics while the ASCD emphasizes the need to promote the full potential of each learner. An extensive examination of the differences between these two documents is provided by McClellan (7). McClellan concludes that the difference between the two concepts of individualization is that each answers a different question. The NSSE concept is an answer to the question: How can we adapt instruction to the unique traits of each child? The ASCD concept answers: By what right do we give instruction? McClellan sees "no obvious conceptual connection between instruction and individualization in the ASCD sense," noting that they might even appear conceptually antithetical (8). McClellan acknowledges that the logistics of individualizing are difficult to handle. The consideration of logistics treated in the NSSE yearbook, has been the focus of the present study.

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4. Robert J. Seidel, "Theories and Strategies Related to Measurement of Individualized Instruction," Educational Technology (August, 1971), pp. 40-47.

5. Ronald Doll (Ed.), Individualizing Instruction, ASCD 1964 Yearbook, (Washington, D.C.: ASCD, 1964).

6. Nelson B. Henry (Ed.) Individualizing Instruction, 61st Yearbook, NSSE (Chicago: University of Chicago Press, 1962).

7. James E. McClellan, "Individualized Instruction: A Projection," in L. G. Thomas (Ed.), Philosophical Redirection of Educational Research, 71st Yearbook, NSSE, Part I (Chicago: University of Chicago Press, 1972), pp. 164-192.

8. McClellan, p. 189.

A discussion is not offered here of the extremely deep and complex questions that can be asked of the task of instructing individual persons. Even a cursory reading from the contributions of educators such as Huebner (9), Apple (10), and Kliebard (11), of philosophers such as Polanyi (12), Buber (13) and Merleau-Ponty (14), suggests that the philosophical underpinnings of "individualized instruction" have not been uncovered and publicly displayed. The one practical solution that the WCAII staff took to the paradox raised by McClellan is that the Descriptor is designed to describe only the systematic features of programs calling themselves "individualized instruction."

Aspects of Instruction and Instructional Procedures

The search for a means to describe as accurately as possible the wide variety of educational programs which are intended to individualize has resulted in the identification of several aspects or features of the practice of individualization in schools. A brief review of the aspects which have been suggested by other scholars underscores not only the varieties of current practice and design but also the complexity of attempting to design and introduce individualization of instruction. The subheadings cited here are those included in the Descriptor as components of individualization.

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9. Dwayne Huebner, "Curricular Language and Classroom Meaning," in James B. Macdonald and Robert R. Leeper (Eds.), Language and Meaning (Washington, D.C.: ASCD, 1966).

10. Michael W. Apple, "Curriculum Design and Cultural Order," in Habue Shimahara (Ed.), Educational Reconstruction: Promise and Challenge (Columbus, Ohio: Charles Merrill, 1972).

11. Herbert M. Kliebard, "Persistent Curriculum Issues in Historical Perspective," in Edmund Short (Ed.), A Search for Valid Content in Curriculum Courses (Toledo, Ohio: University of Toledo Press, 1970).

12. Michael Polanyi, The Study of Man (Chicago: University of Chicago Press, 1959).

13. Martin Buber, The Way of Response (New York: Schocken Books, Inc., 1966).

14. Maurice Merleau-Ponty, The Phenomenology of Perception (London: Routledge and Kegan-Paul, Ltd., 1962).

Objectives.

Individualization of instruction by differentiating objectives is perhaps the oldest method used to adapt to heterogeneous learners. The assignment of objectives to learners has frequently been accomplished on the basis of social status, however; the practice has been used to preserve the status quo. These liabilities in setting differentiated goals are articulated by Cronbach (15). Prescribing heterogeneous goals may perpetuate existing patterns of vocational or social opportunity. Even elective choice of areas of study while perhaps more egalitarian is infrequently based on aptitudes. Except for the obvious importance of prerequisite knowledge in areas such as mathematics, little is known about differential aptitudes.

In spite of problems in differentiating instruction on the basis of differentiated objectives, the need to examine the role of objectives in individualized instruction has been cited. Wilhelms (16) suggests that some of the more obvious problems in differentiating goals might be circumvented by regarding goals in terms of purpose rather than content. Using this approach, attempts should be made to consider the intent of the curriculum in language which identifies common group elements, while searching for a range of ways to help unique individuals achieve those purposes. Trueblood (17) also favors a more general view of objectives, one which would differentiate the intent of instruction. Trueblood feels that available educational materials stress a means oriented conception of diagnosis and instruction, where a goal referenced model would be more useful.

Learner Assessment.

Though the topic of learner assessment has received considerable attention in the literature, the specific, additional requirements placed on the assessment process by attempts to individualize instruction have not been clearly specified. Airasian and Madaus (18) have provided a comprehensive review of four types of student evaluation. They examine

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15. Lee J. Cronbach, "How Can Instruction Be Adapted to Individual Differences?" in Robert M. Gagne (Ed.), Learning and Individual Differences (Columbus, Ohio: Charles E. Merrill Books, Inc., 1967), pp. 23-29.

16. Fred T. Wilhelms, "The Curriculum and Individual Differences," in Nelson B. Henry (Ed.), Individualizing Instruction, 61st Yearbook, NSSE (Chicago: University of Chicago Press, 1962), pp. 62-74.

17. Cecil R. Trueblood, "A Mode for Using Diagnosis in Individualizing Mathematics Instruction in the Elementary School Classroom," The Arithmetic Teacher (November 1971), pp. 505-511.

18. Peter W. Airasian and George F. Madaus, "Functional Types of Student Evaluation," Measurement and Evaluation in Guidance (January 1972), pp. 221-233.

the roles of placement, formative, diagnostic and summative evaluation for each of nine dimensions: function, time, characteristics of evidence, evidence-gathering techniques, sampling, scoring and reporting, standards, reliability, and validity. While their presentation is not offered with individualized programs in mind, it suggests that expanding the traditional conception of assessment may be appropriate to consider simultaneously with expanding instructional alternatives. The critical relationship of diagnostic assessment to instructional means in individualized instruction, as directly addressed by Trueblood (19) was referred to in the discussion of objectives above. He advocates the closer coordination of instruction with assessment based directly on stated goals.

Sequence.

The sequencing of units of content for instructional presentation has been carefully addressed by Briggs (20). Briggs describes the instructional problem of sequence in relation to the independence or dependence of units of instruction and then identifies several types of structure possible for an instructional course which may be observed within the confines of hierarchies dictated by subject material. He offers the extremes of flat structure, when units of material may be presented in essentially random fashion, and vertical structure, when strict progression must be observed. He notes that at least three intermediate variations on and combinations of these patterns may be observed: hierarchical structure, mixed structure, and flat structure requiring spiral sequencing of instruction. In addition to providing this conceptual framework for discussions of sequencing, Briggs extensively reviews research results studying the ways instruction may be preplanned and preprogrammed to meet educational objectives. Experiments reviewed are identified as being of nine types, according to the extent of learner control and the nature of learner-experimenter sharing of control.

Rate.

Differentiation of educational experience by permitting variations in the rate at which learners complete required activities is one of the best known and most widely used aspects of individualization. The

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19. Trueblood, op. cit.

20. Leslie J. Briggs, Sequencing of Instruction in Relation to Hierarchies of Competence (Pittsburgh: American Institutes for Research, 1968).

technique was one employed in early programs of individualization, such as the Winnetka Plan described by Washburne (21), where learners mastered essentially the same material but at their own pace. In several ways differentiation by rate is also one of the easiest aspects to implement. The growing popularity of continuous progress instruction, which differentiates primarily on the basis of rate, provides a good example.

In spite of its popularity in practice, differentiation by rate has been the subject of some philosophical and psychological soul searching. Wilhelms (22) pointed out that such practices still reflected an orientation to groups rather than individuals, allowing for the exercise of only one of several fundamental differences among individuals. His cautions are raised in part because he fears that programs may consider rate differentiation as sufficient for individualization. In discussing the need for a model of individualized instruction, Packard (23) cites the difficulties in measuring the differences in rate which are the consequence of programs featuring self-pacing. For a variety of rate measures (e.g., number of pages or skills or units mastered per day or month), research results have shown that none of these measures are stable. Specific rates are not constant for one or several students, over different subject areas or over units within one subject area. Packard proposes several ways to improve the measurement of rate as a measure uncontaminated by curriculum characteristics or time/effort requirements. His suggestions include relating actual rate to teachers' predictions or adults' rates, and weighting an individual's actual rate by a statistic describing prior performance of many students. Wang and Yeager (24) identify problems similar to those posed by Packard in discussing the measurement of rate variation. They stress the need to analyze the nature of the learning task itself, considering the learning objectives, types of skills to be learned, and the effectiveness of the instructional system.

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21. Careton W. Washburne and Sidney P. Marland, Jr., Winnetka (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963).

22. Wilhelms, op. cit.

23. R. G. Packard, "Models of Individualized Instruction: The Search for a Measure," Educational Technology (August 1972), pp. 11-14.

24. Margaret C. Wang and John L. Yeager, "Evaluation Under Individualized Instruction," Elementary School Journal (May 1971), pp. 448-452.

Grouping.

The subject of rate differentiation is frequently interrelated with that of grouping learners for instruction. Formal education inevitably implies instructing large numbers of students; practical and economic considerations have led to grouping for instruction. The goal of individualization imposes a task of attempting to offer varieties of instructional experience to groups of students. Flexibility of grouping and using groups of differing sizes has received considerable attention in the literature. Harlan (25) cites on a variety of opinions on the subject of grouping rather than on research results. Grouping, whether for short or long periods of instruction has alternately been praised as an important part of individualization as by Clymer and Kearney (26) and criticized as restrictive to personalization as by Parker (27) and Westby-Gibson (28). The testing of these hypotheses in research settings appears to be largely unaddressed.

Media.

The development of a variety of educational media has eased a number of the operational problems associated with rate differentiation and flexible grouping. Many audio visual aides are suited to use with groups of different sizes; instruction of a single learner by means other than printed materials is also possible with dial access, computerized instruction, teaching machines and a number of manipulative materials.

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25. William J. Harlan (Ed.), A Study of Attitudes Toward Individualization of Instruction and Beliefs Concerning Experimentalism Before and After Student Teaching (North Texas State University, 1971), pp. 18-22.

26. Theodore Clymer and Nolan C. Kearney, "Curricular and Instructional Provisions for Individual Differences," in Nelson B. Henry (Ed.) Individualizing Instruction, 61st Yearbook, NSSE (Chicago: University of Chicago Press, 1962), pp. 265-282.

27. Don H. Parker, Schooling for Individual Excellence (New York: Thomas Nelson and Sons, 1964).

28. Dorothy Westby-Gibson, Grouping Students for Improved Instruction (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966).

Some of the variety and possible uses are examined by Klaus (29). Klaus offers comprehensive descriptions of both well-known and relatively new media, ranging from printed materials to dial access and computer management. He analyzes the usefulness of several techniques and presents case studies of innovation.

Despite the proliferation of available instructional media, limited attention has been given to the psychological bases for preferring one type of instructional media over another to present particular kinds of materials. In discussing the relationship of learner variables to educational media, Briggs (30) concludes that "one does not hope to find evidence for matching a medium with a person or subject matter area; instead one seeks to consider learning characteristics while analyzing tasks with respect to the optimum kind of stimuli and learning conditions which can be provided by various media." After a comprehensive review of classroom research in educational media, Briggs and his fellow researchers (31) concluded that experiments were not designed to provide the kind of information required to develop a needed procedure for selecting effective media for instruction.

Management.

Instructional management has been discussed in the literature more frequently in the context of possibilities offered by computerized management systems than in the more general context of the need for techniques to coordinate varieties of instruction and different learners. A review of several computer-based management systems to support individualized programs is presented by Baker (32). A specific suggestion for managing individualized programs was given by Kapfer (33), who advocates the use of PERT but does not present a fully operational system. Kapfer describes the essential characteristics of a PERT formulation of a project and suggests that its usefulness in a variety of settings makes it a likely candidate for assistance to individualized programs.

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29. David J. Klaus, Instructional Innovation and Individualization (Pittsburgh: American Institutes for Research, 1969).

30. Leslie J. Briggs, "Learner Variables and Educational Media," Review of Educational Research (April 1968), pp. 160-176.

31. Frank B. Baker, "Computer Based Instructional Management Systems: A First Look," Review of Educational Research (February 1971), pp. 51-70.

32. Philip G. Kapfer, "An Instructional Management Strategy for Individualized Learning," Phi Delta Kappan (January 1968), pp. 260-263.

33. Leslie J. Briggs, Peggy Campeau, Robert Gagne and Mark May, Instructional Media: A Procedure for the Design of Multi-Media Instruction, A Critical Review of Research, and Suggestions for Future Research (Center for Research and Evaluation in Applications of Technology in Education: American Institutes for Research, 1967).

Cross-component Emphases.

In addition to the discrete areas related to instruction which have been mentioned above, there are aspects of individualization cutting across these components. Most notable is the interest in decision making: exploring the potentialities for individualization which are implied by having decisions made by different participants in instruction. Wolfson and Nash (34) have studied decision making in non-individualized elementary classrooms. The focus of their interview and questionnaire techniques has been the discrepancies between children's and teachers' perceptions of who makes decisions related to planning and scheduling of content areas and to administrative activities. The benefits of having learners make choices related to their own instruction are examined by Harlan (35). A conceptual scheme which considers the extent of decision making by both learner and teacher in the areas of pacing, materials and objectives as one way of assessing the degree of individualization is advanced by Esbensen (36). Esbensen uses a matrix format to show decision making (one dimension) related to the three areas of instruction. Those programs which had more decisions made by learners would, according to Esbensen, be more individualized than others.

Taxonomies Describing Individualization Procedures

The development of a system or model to describe all aspects of individualized instruction has been addressed by some scholars. The differences among the few published systems which are most notable are the way subject matter, learning theory, and institutional factors are treated and, usually, interrelated. In addition, the influence of the many studies of teaching behavior and teacher observation may be observed in the choices of variables considered in describing individualized instruction. (37)

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34. Bernice Wolfson and Shirlyn Nash, "Perceptions of Decision Making in Elementary School Classrooms," Elementary School Journal (November 1968), pp. 89-93; and Bernice Wolfson and Shirlyn Nash, "Who Decides What in the Classroom?" Elementary School Journal (May 1965), pp. 436-438.

35. William J. Harlan (Ed.), A Study of Attitudes Toward Individualization of Instruction and Beliefs Concerning Experimentalism Before and After Elementary Student Teaching (North Texas State University, 1971), p. 17.

36. Thorwald Esbensen, "Individualized Instruction and Self-Directed Learning," in Robert A. Weisgerber (Ed.), Perspectives in Individualized Learning (Itasca, Illinois: F. E. Peacock, Inc., 1971), pp. 268-281.

37. Many systems for examining instruction are collected in Mirrors of Behavior. While most of the observation protocols included here are obviously intended for application in non-individualized classrooms, a few have applicability to individualized instruction. See Anita Simon and E. Gil Boyer (Eds.), Mirrors for Behavior II: An Anthology of Observation Instruments--Volumes A & B (Philadelphia: Research for Better Schools, 1970).

In devising a means of describing classrooms, Herbert (38) developed a System for Analyzing Lessons which includes variables to be observed and monitored in the classroom. Intended as a model of teaching, Giving Lessons is singled out as the one of five possible ways of teaching to be examined by the system. Six components of Giving Lessons are identified:

Subject Matter of Lesson

Form of Lesson--the pattern of interaction between teacher and student

Form of Subject Matter--the ordering or shaping of the subject matter being presented

Media of Lesson--the resources used to transmit the material

Grouping and Location of Students and Teachers--the distribution and physical movement of teachers and putting into effect criteria for classifying students

Influence Techniques--teachers' efforts to obtain, exercise or delegate control over other components

With some alternatives, these components have provided the basis for an observation protocol describing classroom activity. The results have been used for comparing strategies of different teaching and for self-evaluation by teachers.

The use of a variable classification for decision making (Influence Techniques) by Herbert was also a feature of the system by Esbensen (39) which was cited above. Esbensen related his discussions of decision making directly to individualized instruction. Esbensen's matrix identifying the degree of decision making by both learner and teacher, for each of the three variables of pacing, materials and objectives was intended to provide the basis for an index of the extent of individualization.

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38. John Herbert, System for Analyzing Lessons (SAL), reprinted in Mirrors for Behavior, #46 (University of Pittsburgh: Learning Research and Development Center, 1966).

39. Esbensen, op. cit.

The important aspects of curriculum enumerated by Romberg and DeVault (40) and generalized from mathematics to all individualized learning by DeVault and Kriewall (41) suggest additional variables for consideration. The model includes Content, Learner, Teacher and Instruction categories. Content is defined to include the rate, sequence and scope of the presented material, while Instruction encompasses communication styles, degree of autonomy and materials. These categorizations suggest variables of interest but do not trace interrelationships nor propose operational techniques for securing or analyzing relevant data.

A more recent effort to portray classroom practice by Goodlad and Klein (42) has generated a framework for classroom observation which contains twelve categories. Variables which the researchers denoted as important were:

Milieu
Instructional Activities (Grouping, Pacing)
Subject Matter
Materials and Equipment
Involvement (teacher and student)
Interaction (teacher and student)
Inquiry
Independence (free movement, permissions)
Curriculum Balance
Curriculum Adaptation (to groups of students)
Ceilings and Floors of Expectancy
Staff Utilization

In application of the framework, observation of some of the categories was found to be infeasible and the framework was simplified to permit primarily anecdotal recording.

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40. Thomas A. Romberg and M. Vere DeVault, "Mathematics Curriculum: Needed Research," Journal of Research and Development in Education (Fall 1967), pp. 95-112.

41. M. Vere DeVault and Thomas Kriewall, "Differentiation of Mathematics Instruction," in E. G. Begle (Ed.), Mathematics Education, 69th Yearbook, NSSE (Chicago: University of Chicago Press, 1970), pp. 407-432.

42. John I. Goodlad, M. Frances Klein and Associates, Behind the Classroom Door (Worthington, Ohio: Charles A. Jones Publishing Co., 1970).

A project to describe elements of instructional programs which would facilitate comparisons was conducted by Gibbons (43). Gibbons cited the nature of several observed programs on each of fifteen elements:

Percent of Student Body
Percent of School Day
Attendance
Materials for Study
Method by which Materials are to be Studied
Pace at which Materials are to be Studied
Activity that Accompanies Choice
Decision Making
Teaching Focus
Teaching Function
Teaching Method
Environment
Time Structure
Evaluation
Objectives or Purposes

For each element, Gibbons identified a continuum of four levels, one signifying the most individualized. For example, Decision Making may be a matter of individual choice, individually prescribed, subgroup prescribed or discussed, or class or grade prescribed.

Conclusions

A review of the literature relating to individualized instruction produces several conclusions. First, one is again impressed by the gulf between theoretical research in learning differences and studies of educational practice. Theoretical studies often deal with the results of single behaviors that are difficult to perceive in a classroom. In contrast, educational practices may be based on heroic generalizations from limited research studies. Second, one notices a very narrow view of instruction characteristic of much discussion. Not only are these views partial, but they are also offered from a range of perspectives that make comparisons of several observations about aspects of instruction, such as rate, difficult to formulate. While careful scrutiny of particular aspects is undoubtedly necessary to the study of existing or proposed procedures, examining these heterogeneous observations may be disconcerting to one attempting to integrate them into any sort of cohesive system.

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43. Maurice Gibbons, Individualized Instruction: A Descriptive Analysis (New York: Teachers College Press, 1971).

It is clear that limited attention has been given to the mapping of a comprehensive picture of individualized instruction. It is also obvious that anyone attempting to generate such a picture should be aware of the shakiness of the theoretical foundations on which a comprehensive picture must currently rest. Researchers should be attuned to the implications of the as-yet-unexamined assumptions which almost certainly will be integrated into the design.

CONSULTATION WITH QUALIFIED PROFESSIONALS

Important to the process of developing the Descriptor were four scheduled conferences with consultants. These one-day conferences with from three to six consultants were held in September, November, and December, 1972 and January, 1973. These conferences were scheduled during the months when the Descriptor was being designed and different versions and data gathering techniques were being field-tested by the staff.

Each consultant meeting addressed specific features of the current versions of the Descriptor. These features included the major components identified to describe individualized instruction, the terminology used within the Descriptor components and the techniques being used to collect the data to support the description. Consultants were invited to address these features of the Descriptor in terms of the specified purposes for which it was being designed. The consultants for each session were chosen for their background in those educational fields where expert responses were considered to be necessary and most helpful to the continued development of the Descriptor.

Following is a list of those persons attending each meeting and a brief description of the issues addressed at those consultant meetings.

<u>September, 1972 -- Theory</u>

Consultants: James MacDonald, Professor of Education,
University of North Carolina

Barak Rosenshine, Professor of Education,
University of Illinois

Thomas Barrett, Professor of Curriculum & Instruction,
University of Wisconsin, Madison

John M. Kean, Professor of Curriculum & Instruction,
University of Wisconsin, Madison

The purpose of this meeting was to address two basic questions about the Descriptor as it appeared at that time.

1. Are there important features of individualized instructional programs that are not included in the Descriptor?

2. What data collection procedures may be used (or modified) to collect the kind of information that the Descriptor was designed to portray?

The discussion of this meeting centered around the application of the above questions to the Descriptor in terms of the original purposes specified for the Descriptor. In general terms, this included looking at the Descriptor both as a political/historical value-laden document from a humanistic perspective (MacDonald) and as an instrument which could be applicable to an objective, neutral-valued research oriented perspective (Rosenshine). Many suggestions for relating the sensitivity of the Descriptor to both these perspectives were incorporated into later versions of the Descriptor. One important issue in the discussion in this and subsequent consultant meetings was the need for a clear understanding of the limitations and restrictions the staff placed on the use and focus of the Descriptor.[1]

November, 1972 -- Public School Use

Consultants: John Aceto, Supervisor of Mathematics, Racine Public Schools, Racine, Wisconsin

Leo Anglin, 1st grade teacher and team leader, Woodland School, Elkhart, Indiana

Harold Jung, Assistant Professor, Department of Elementary Education, University of Florida

Lorraine Sullivan, Superintendent of Instruction, Chicago Public Schools

Carl Grant, Project Associate, Department of Curriculum & Instruction, University of Wisconsin, Madison

The purpose of this meeting was to discuss and analyze the most current version of the Descriptor in terms of the variety of techniques used in classrooms where individualized instruction is being attempted. This included a discussion on the sensitivity of the terminology and organization of the current Descriptor to specific operational characteristics of many different forms of "individualized instruction." The staff felt that it was very beneficial to have the Descriptor analyzed and discussed by educators who were attempting to provide individualized instruction in the schools through their different teaching and supervisory positions.

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1. The restrictions are delineated in section V, "Conclusions from the Field-Test, Limitations."

These positions included those of teachers (Anglin), a curriculum specialist (Aceto), an administrator (Sullivan), and a teacher educator (Jung).

December, 1972 -- Research Use

Consultants: Berdie Grass, 5th grade teacher, Madison, Wisconsin

Frank Baker, Professor of Educational Psychology, University of Wisconsin, Madison

Bill Bregar, Project Associate, University of Wisconsin, Madison

Bill Bush, Assistant Director, Research and Development Center, Madison, Wisconsin

Issues addressed at this meeting included the techniques being used to collect data for the description of functioning individualized programs and the methods being considered for communication of program descriptions to school personnel. Back-up sheets had been developed by the staff to facilitate recording the information necessary to complete the Descriptor as well as to provide some additional detailed information about the individualized instructional program being described. Much of the discussion centered around these back-up sheets and the techniques being used to record the primary data from classroom observation and interviews of students and teachers. A valuable result from this meeting was the determination that a technique based upon teacher and student interviews was appropriate for the research purposes for which the Descriptor was being designed.

January, 1973 -- Teacher Education

Consultants: Horace Aubertine, Professor of Education, Illinois State University

Bill Licata, Project Associate, Buffalo University, Buffalo, New York

John Masla, Professor of Education, Buffalo University, Buffalo, New York

The main focus for this session was the application of the Descriptor to portray current attempts and goals for individualizing teacher education. By this time the Descriptor had evolved to the format to be used at the fifteen principal field test sites included in this report.

The main question which was addressed at this meeting was, to what extent is this instrument sensitive to current practices and to ideal programs being developed for individualizing teacher education? Discussion centered around specific teacher education programs and the applicability of the Descriptor to the different perspectives represented by these programs.

Summary

The four consultant meetings proved to be significant in the development of the Descriptor in many ways. For example, one incidental requirement that proved helpful was the repeated need for the staff to communicate the original intentions for the Descriptor. Stating and restating the purposes for the Descriptor as well as its limitations was an important feature in the continuous development and focus of the Descriptor by the staff.

The analysis of the Descriptor in its various forms by persons with different backgrounds and interests in individualizing instruction was also valuable in formulating a Descriptor to meet the specifications originally intended. Discussions were taped, notes were taken in each meeting and the new issues and reactions were then addressed by the WCAII staff. The continuous development of the Descriptor and the variety and evolution of the techniques used for data collection may be the best indicators that these four meetings did prove valuable to the development of the Descriptor for Individualized Instruction.

EVOLUTION OF DATA GATHERING PROCESS

Throughout the development of the Descriptor, techniques to provide data for individual components, such as Rate, Media and Sequence, were tested in a variety of ways in the classroom. The WCAII staff are experienced teachers whose observations and experience provided a basis for much of the detail in these components. It was also helpful to check individual components through discussions with teachers about their programs and through repeated visits to sites where individualized instructional programs were in operation. This process provided the WCAII staff with information that was used to refine components and to develop a strategy for gathering data.

The first step in devising techniques for obtaining information was to visit several individualized instructional programs. These initial visits were undertaken to respond to such concerns as, what types of activity could one expect to see in an individualized program? Which activities are relevant to observe? Who would one like to talk to about the program? Conclusions from these visits pertained directly to the development of a data-gathering strategy as well as to component definition and delineation.

The WCAII staff was impressed by the multi-faceted nature of individualized programs. There appeared to be many aspects of the program which would not be revealed by only observing it. These aspects included the organization of instructional materials, the direction of learners through the program, the handling of other instructional decisions, the perceptions of learners and instructors regarding their roles and responsibilities, the maintenance of program records. Because all of these aspects were considered to be important to the complete description of individualized instruction, an early decision was made to try a variety of techniques for gathering information concerning the complex nature of individualized instruction.

Direct observation was examined as a technique for describing programs. (A bibliography of related sources consulted by the WCAII staff is included as Appendix B of this report.) Because individualized programs may be characterized as a variety of plans for activities over several days, the staff felt that one day's sampling not only produced limited results but probably produced biased reporting of the actual distribution of group sizes and media types. Since direct observation produced little insight into the nature of the instructional activity occurring, interviews with learners and instructional personnel were tried. The instructors were found to offer an essential source of information for the accurate portrayal of the program, even though their resources may have reflected some bias.

Combining observation and interview, a pattern was slowly developed that included presentation of the Descriptor. To acquaint program personnel with the Descriptor, its components of individualization and its terminology, a series of overlays for use with an overhead projector were developed. The transparencies showed the components and then showed a variety of program descriptions for each component. These transparencies were used to assist viewers in understanding components and the possible ranges of variation. Viewers were then called upon to describe the appropriate representation of the component for the program they were describing, either by relating it to one of the examples (if that was appropriate) or by suggesting a new pattern of representation.

The process was tried out both with individuals and with groups of persons associated with a single program. In the latter one, the group achieved a consensus in their discussions before the Descriptor component was filled in. An anecdotal record noting points brought out in discussion or deliberation was maintained to provide clarification or additional information. This information was incorporated into a written statement of from two to four pages, which accompanied the filled-in Descriptor. With little variation, this group interview was practiced throughout the remainder of the project during the field testing of the completed system.

III. FIELD TEST EDITION OF THE DESCRIPTOR

INTRODUCTION

This section contains a copy of the Descriptor that was used for collecting the data and describing the programs at the field-test sites. This edition of the Descriptor is shown in three ways. At the beginning of this section is a small copy. The major portion of this section includes documentation which explains the components and defines the terminology found on this edition of the Descriptor. This documentation is organized into the ten components described on the Descriptor. Included are separate reproductions of each component as they appeared on the field test edition of the Descriptor. At the end of this section is a fold-out copy of the field test edition of the Descriptor. After the sites were described, a copy of this documentation was sent to each site along with the appropriate set of charts and a short verbal description of the visited program.

DESCRIPTOR FOR THE ANALYSIS OF INDIVIDUALIZED INSTRUCTION

RATIONALE AND DESCRIPTION OF COMPONENTS

The motivation for education which meets the needs of individual learners has generated a wide variety of programs designed to individualize instruction. Research and development efforts funded by the Office of Education and private foundations, commercial publications, and local school districts have resulted in many programs which offer individualization. Each program is unique in some way. Schools, teachers, or other educational institutions respond to a desire to individualize in terms of their own concepts, interests, and resources.

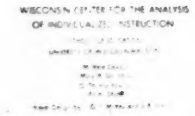
Strategies currently in use under the rubric of individualization have resulted from varied sets of values, concepts, commitments, and competencies. Communication among educators about individualization often lacks substance for two reasons. The first of these is the lack of understanding of principles and instruction which have guided the development of a given program. The second growing out of the first, is the need for communication with others in the field regarding the routine but critical matters of designing and operating a specific individualized program. Terminology differs, goals and objectives (purposes) for which programs are designed differ, implementation strategies differ, hopes and aspirations differ and consequently results differ.

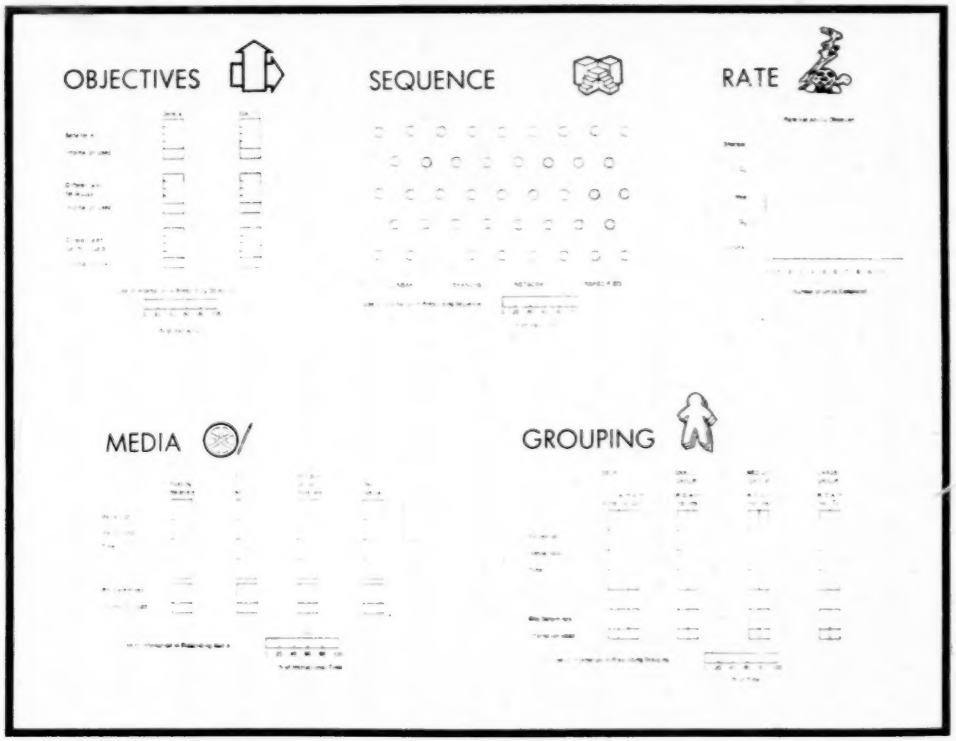
This variety has motivated the development of a system which provides a common basis for the description of instructional programs which offer individualization. The system, in addition to proposing a terminology which is applicable to all programs, is specifically formulated to

Descriptor for the Analysis of Individualized Instruction

KEY

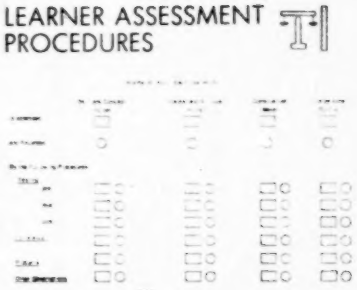
PRELIMINARY PROGRAM DESCRIPTORS



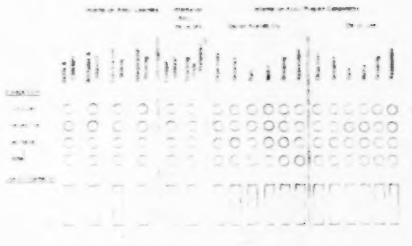


PROGRAM PATTERN

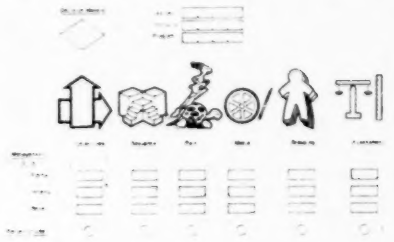
LEARNER ASSESSMENT PROCEDURES



MANAGEMENT OF INFORMATION



MANAGEMENT OF INSTRUCTIONAL COMPONENTS



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This variety has motivated the development of a system which provides a common basis for the description of instructional programs which offer individualization. The system, in addition to proposing a terminology which is applicable to all programs, is specifically formulated to

identify, quantify and describe significant dimensions of a program's individualization. The comprehensive description is summarized by a graphic presentation abstracted from the detail of comprehensive data collection and reporting.

Purposes of a System to Describe Individualization

This comprehensive system for the description of individualized instructional programs should serve several purposes. As a pedagogical device, the system should suggest the many dimensions of individualization as well as the complexity of managing individualized instruction. The graphical presentation of components of individualization should demonstrate their interaction, as well as underscore their complexity.

When used as a tool for examining individualization the comprehensive system should lend itself to several uses. It can be used to analyze a given program either as it is described in associated literature, described orally by teachers and administrator/supervisors responsible for the operation of the program, or reported through observation as the program is in use with learners. The instrument can serve in many capacities:

(1) As a report generated through observation of the program in use with learners:

(a) The same program can be compared in operation in different schools serving like or different socio-economic populations.

(b) The same program can be compared over time as a faculty and staff continue the development and implementation of a program.

(c) The same program in a given school can be reviewed as a prelude to its adaptation to serve different learners within that school.

(d) Different programs can be compared in operation in different schools.

(2) As a report generated through oral descriptions by teachers and administrator/supervisors:

(a) Programs described by a group of teachers can be presented graphically to determine if, indeed, that is the kind of program they wish to implement.

(b) Alternative program designs can be described by a single group of teachers for study in the graphic format to determine feasibility and desirability.

(3) As a report formulated from descriptions of available programs and associated literature:

(a) Prior to the implementation of an available program, school personnel can utilize the system to make a comparative study of alternative options.

(4) As a report which combines two or more of the data sources:

(a) Comparing the descriptions of literature and observations in classrooms provides a base for determining the extent the program is meeting specified requirements in a given setting.

(b) Comparing the description by teachers and administrator/supervisors with that determined by observation, staff can determine the extent to which the program is functioning as they believe it is.

(c) Utilizing all three descriptor sources, staff can first discuss a program to be developed, viewing sequential graphic displays which represent their thinking; they may then wish to write a statement which describes the program they have chosen; and finally they may monitor the development of the program through continued use of the instrument to observe children in the program.

Choice of Components to Describe Individualization

A comprehensive system to describe individualization must include a general set of descriptors which reflect the different emphases and the pedagogical aspirations motivating those who develop programs which individualize. The set of descriptors must not be designed to respond only to a particular program, but must be complete enough to depict the relevant parameters of any program.

Two factors dominated the selection of components for the present system. First, it is acknowledged that learners have fundamental differences. Second, it is recognized that educators face practical problems as they attempt to respond to these individual differences in the course of instruction. The second factor influenced the choice of language and style of presentation. While the system is consistent with present theoretical principles relating how individuals learn, it is expressed in the language of the classroom. A closer review of these two factors will explain the selection of the ten components.

Students introduce heterogeneity into any learning situation. They differ in interests, in the speed with which they "master" content (for whatever reason), in the previous experiences and learning that they have had and in the particular pattern or style by which they learn most effectively. Because any program to individualize is responding to the learner, it conceivably could address any or all of these areas of student differentiation.

Those who plan for instruction are faced with a multitude of practical problems. Regardless of whether they are designing instruction to maximize the potential of every learner (which likely would increase the heterogeneity among learners) or present essentially the same material to a diverse group of learners (which would attempt to reduce heterogeneity), programs are designed to match students with instructional experiences. Decisions must be made concerning several parameters: for example, the choice of content the learner is to master, amount of content which will be presented in a given time, the ordering of selected topics and the nature of the actual presentation to the learner.

Components which permit the examination of individualized instruction from the perspective of either the learner or those planning instruction are: Objectives, Rate, Sequence, Instructional Materials (Media), Instructional Group Size (Grouping), Learner Assessment Procedures, Management of Information, Management of Instructional Components and Program Pattern. To these nine components is added a tenth, Preliminary Program Descriptors, to describe the setting for any application of the system. The components suggest where individualized instruction may be conducted. Brief definitions of the components follow.

Preliminary Program Descriptors. Preliminary program descriptors provide factual information for an analysis of an individualized program, identifying the area of application. This component must indicate the character of the subject being considered whether it be ideal, proposed or actual instructional systems. In applying the system, this component is treated first to provide the context for subsequent analysis.

Objectives. An instructional objective offers a rationale for including instruction in a given topic in the educational process. Learners may have differing interests, values and personal goals. Because the rationale for studying a particular topic may not apply to all learners, an instructor may wish to provide different objectives for different learners. Thus, the differentiation of objectives is one way in which an instructional program may be individualized.

Sequence. Sequence is the order in which topics are addressed in instruction. Learners bring unique sets of prerequisite skills and experiences to the instructional process, suggesting that alternative

arrangements of topics may be desirable for different learners. Considerable variation in the sequencing of specific topics is feasible, within the framework of current taxonomies and hierarchies which describe progressions in instruction. Thus, the sequencing of topics is another way in which instruction may be individualized.

Rate. Rate is the length of time learners require to reach some definable level of mastery of specific material. The rates at which persons learn may vary widely. Therefore, the rate of presentation of material is a second way in which a program may be individualized.

Media. Media is what instructional materials are used by the learners. Learners differ in the ways in which they learn most effectively. Thus, alternative materials may be desirable for communicating similar information to different learners. Since a variety of instructional materials suggests that considerable potential for differentiating instruction is available, media is another way in which individualization may occur in a program.

Grouping. Grouping is the number of learners working together on the same task at the same time. "Individualized instruction" suggests two possibilities for grouping for instruction. One is that there may be more instructional-tutorial assistance for learners. The second is that grouping patterns may be different for different learners. Both of the possibilities suggest that grouping is another possible way to individualize an instructional program.

Learner Assessment Procedures. Learner assessment is the kind of information gathered about learners and the gathering techniques for providing this information. Not only do learners vary as individual

persons but it may be expected that there can exist different methods of gathering information which may vary in their applicability (or reliability) to different learners. Learner assessment not only suggests that the variety of techniques of assessing the learner may be individualized but it also indicates in what ways the program is considering that different learners may vary.

Management of Information. Management of Information is the manner in which the program records specific categories of information about the learners, instructors and the instructional options within the program, and the extent to which this information is used. Since individualized instruction often depends upon the possibilities for rapid retrieval of information, the storage for and the extent of the record keeping may be crucial to the decisions by mode within an individualized program. Whether the stored information is used and who uses the information may also be crucial to the operation of a program that attempts to individualize instruction.

Management of Instructional Components. Management of Instruction is the formulation and execution of a system to bring learners and instruction together. In any program attempting to individualize, the task of managing instruction may become extremely complicated for each of the six instructional components described (objectives, sequence, rate, media, grouping, and learner assessment). For a program which is attempting to individualize it often must be determined how to schedule the learners to the instructional activities within the program. Scheduling of a program's instructional resources to individual learners may be preplanned, worked out in planning sessions or identified without prior planning.

Program Pattern. The program pattern is the possible sequences of work-study activities and assessment procedures used by the learners progressing though the program. It has been observed that most individualized instructional programs have a preplanned sequence of instructional activities and assessment procedures that is repeated for each instructional unit. One way in which an individualized program may be described is by the description of the different ways in which different learners may progress through the work-study activities and assessment procedures of a program.

In conclusion, ten components have been identified to facilitate the description of individualized programs. They are:

Preliminary Program Descriptors

Objectives

Sequence

Rate

Media

Grouping

Learner Assessment Procedures

Management of Information

Management of Instructional Components

Program Pattern

The choice of components has been made in recognition of individual differences and of the need to respond to those differences through instructional programs.

PRELIMINARY PROGRAM DESCRIPTORS

Source of Data	functioning program	perception of functioning program				ideal program				developer intent	
		tchr.	adm.	supr.		tchr.	adm.	supr.		stmts.	mtls.
Production Agency	local schools	educational agency			commercial agency						

DESIGN CHARACTERISTICS

Subject Matter	mathematics	reading	teacher education														
Grade Equivalents	P	K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Packaged as	modules	tests	multi–texts														
Learner Arrangement	alone	fixed groups	changing groups														

IMPLEMENTATION CHARACTERISTICS

Grade Equivalents	P	K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Learner Arrangement	alone	fixed groups	changing groups															
Staff Arrangement	teacher	teacher group	specialist(s)	aide(s)														
Learner Time	unscheduled	scheduled/fixed	scheduled/flexible															
Space Arrangement	open	multiple rooms	single room															

PRELIMINARY PROGRAM DESCRIPTORS

The Preliminary Program Descriptors component identifies the institutional setting of an instructional program. This component provides information about the context within which the data were collected. Included in addition to the context of the program is the designation of the source of data used to describe the program. The component has three sections. The first identifies source of data and production agency for the program. The second examines the institutional characteristics intended for the program by its developers. The third examines the institutional characteristics associated with the implementation of the program at the site presently considered. A brief description of the three sections suggests the scope of information presented by the component. Specific terms are identified at the end of the discussion.

DESCRIPTOR FOCUS

The first section of the component designates two characteristics of the program being described: the observation of the program and the conditions under which the program was developed. The program portrayed on the Descriptor may be a functioning program, an ideal program, or a program as intended by the developers. The production agency may be local schools, an educational agency or a commercial agency.

DESIGN CHARACTERISTICS

The second section describes the condition under which the program was or is being designed to operate. Subject matter, grade equivalents of the materials, physical characteristics of the instructional materials, and the intended groupings of learners.

IMPLEMENTATION CHARACTERISTICS

The third section identifies the uses made of the program in an operational setting. This section would not be completed if the observation was limited to a developer's view. It indicates grade equivalents and learner arrangement for implementation specifically, but also adds features which might not be addressed in designing programs, such as staff arrangement, learner time assigned to the program, and space arrangement used in implementation.

COLOR CODING

Green is used for all indicators colored in Preliminary Program Descriptors.

GLOSSARY OF TERMS

In deciding how to describe a given program, the following terms should clarify possible ambiguities in the Descriptor. The terms appear here in the order in which they are found in the component.

Source of Data

Functioning program. Information about a functioning program may be obtained from direct observation of a program in operation by outside observers, together with responses on interviews with participants in the program, either instructors or learners.

Perception of functioning programs. Information about functioning programs may also be obtained solely from interviews with persons acquainted with the program in question: teachers, school administrators (principal or curriculum supervisor), or school superintendent. The program is not systematically observed in operation by any outside observers.

Ideal program. Information about an intended program may be obtained from interviews with persons who have formulated or are formulating the details of a program. The program is currently in operation in the form in which it is being described. Interviews may be with teachers, school administrators or supervisors.

Developer intent. Information about an intended program may also be obtained from the developer of a program, without concern for implementation of the program at a particular site. Source of the information may be verbal statements by the developer or direct examination of instructional and descriptive materials.

Production Agency

Local schools. The program was developed on site by faculty and staff of the institution in which the program is implemented.

Educational agency. The program was developed by a non-profit group working with and for schools (such as a State Department of Public Instruction or a nationally funded Research and Development Center). The program may be intended for use by many schools.

Commercial agency. The program was developed by a profit-making group, to be marketed to schools as a commercial venture.

Package Characteristics

Modules. The program is presented within self-contained units of content. Each unit may use or access a variety of instructional modes with considerable variation for individual learners, but the module is the organizational unit for program operation.

Tests. The program employs a set of tests to establish the organizational basis of the program. Mastery of tests are used to establish learner progress.

Multi-texts. A variety of texts or other commercial materials provide the basis for the program. No one text serves as the principal organizing factor.

Learner Arrangement

Alone. The program is designed in such a way that learners are engaged in self-study most of the time.

Fixed groups. The program provides for group instruction, with groups being established infrequently (perhaps only once in an academic year). The group then serves as the focus of instruction.

Changing groups. The program provides for some group instruction, with groups changing during the instructional period for reasons such as interest, variety, mastery.

Staff Arrangement

Teacher. A single teacher in his or her own classroom is responsible for all planning and instructional activity.

Teacher group. Several teachers work with a group of learners. Planning is cooperative. Specific responsibilities may be rotated or constant, but there is some differentiation of responsibility at any given time.

Specialist(s). A person with training and responsibility which differs from that of other teachers who work with the program.

Aide(s). A person with specially designated clerical or tutorial responsibilities who works under the direction of teachers in the program.

Learner Time

Unscheduled. Learners may work on the program at whatever time during the day they wish. There is no specified time when a learner must be at work on any given aspect of the program.

Scheduled/fixed. Definite times during the day or week are set in a school's schedule for the operation of the program. Learners assigned to the program must work within the program for that time.

Schedule/flexible. Definite times during the day or week are set in a school's schedule for the operation of the program. Within that time, learners are granted some flexibility of activity; there may be instances when they are not required to work in the program.

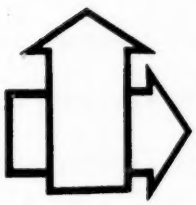
Space Arrangement

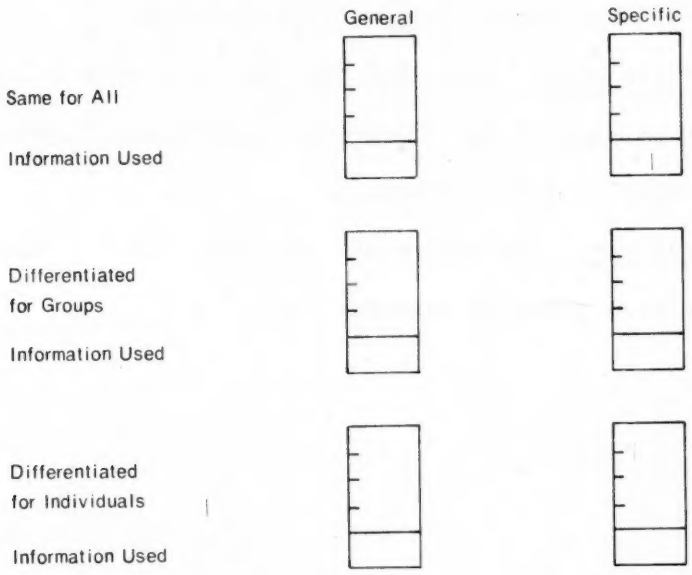
Open. Open defines a single space without walls which is larger in size than the single, conventional classroom.

Multiple rooms. More than one room is used to house the program. Rooms may be conventional classrooms or encompass a number of classrooms or special purpose rooms.

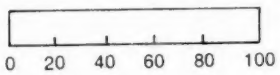
Single room. The entire program takes place at one location, no larger in size than a traditional classroom.

OBJECTIVES





Use of Information in Prescribing Objectives:



% of Instruction

OBJECTIVES

The Objectives component refers to the stated purposes of the instructional program. The description of instructional objectives in the present system is done in two dimensions. One dimension is the type of objective, the other dimension is the way the objectives are identified with the learners. The use of information in prescribing objectives is also determined. The Descriptor considers two categories of objectives: general and specific.

The major consideration given to these objectives is the extent to which they are identified with individual learners. There are three ways in which the objectives can be identified with the learner. One, the objectives can be identified as being the same for all learners. Two, the objectives can be identified as differentiated for certain groups of learners. Three, the objectives can be identified individually, that is, learner-by-learner. The features of the categories of objectives and the way the objectives are identified with learners are described below.

CATEGORIES OF OBJECTIVES

General. General objectives are most often identified as long-term goals which relate the learner to roles beyond the instructional setting.

Specific. Specific objectives are those objectives which are more explicitly related to certain instructional activities. The statement of the specific objective may or may not be in terms that require observation of the learner's overt action. The objectives may be explicitly stated in behavioral terms.

WAYS OF IDENTIFYING OBJECTIVES WITH LEARNERS

Same for all. Objectives are assigned without differentiation among learners. All learners within a program are identified with the same objectives.

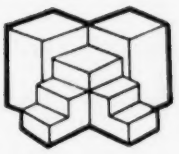
Differentiated for groups. Objectives are identified with different groups of learners within a program. Common objectives may be identified for groups that are classified on such categories as (1) aptitude and/or achievement, (2) sex, age, ethnic classifications, or (3) interest.

Differentiated for individuals. Objectives are individually prescribed for each learner. Assignments to objectives could be made on the basis of individual choice, needs assessment by program and individual, or as part of the instructional activity.

USE OF INFORMATION

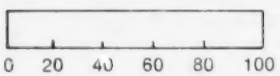
The Use of Information Scale provides a percentage calculation of the degree to which objectives are prescribed on the basis of some information.

SEQUENCE



LINEAR BRANCHED NETWORK NONSPECIFIED

Use of Information in Prescribing Sequence:



% of Instruction

SEQUENCE

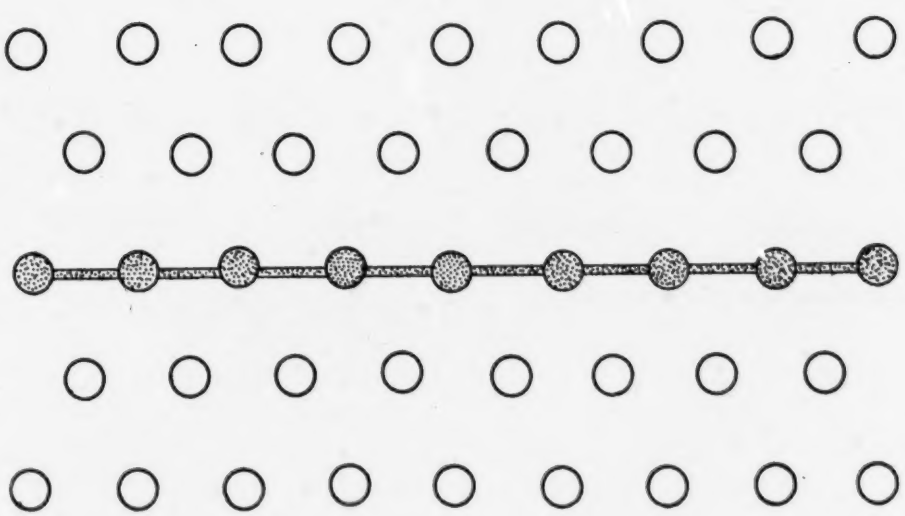
The Sequence component refers to the order in which units of instructional material are studied by learners. In most individualized programs, materials are organized into chapters, units, modules or other packages. This component examines the options for studying those units which are available to learners in the program.

Though units are made up of instructional content, this component does not examine the organization of content either within or across units.

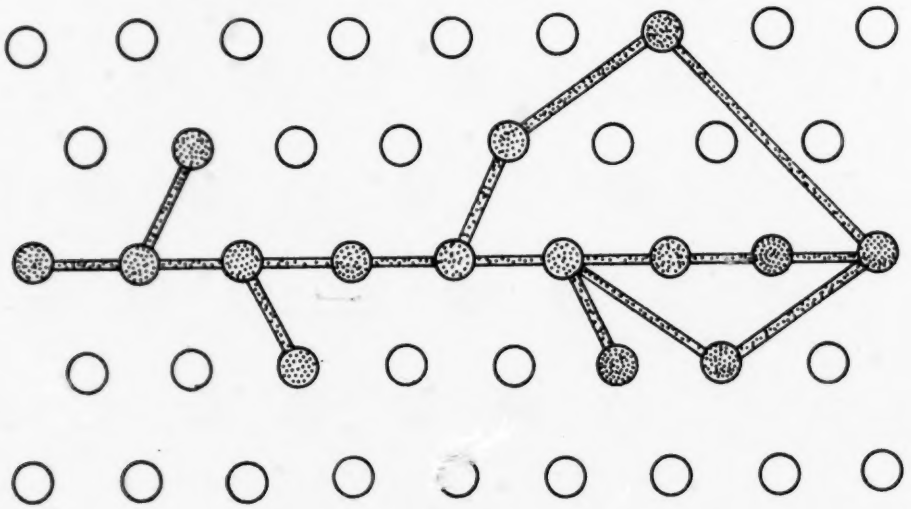
PATTERNS OF SEQUENCE

Four patterns of sequencing have been identified as representative of the range of possible sequences for required study:

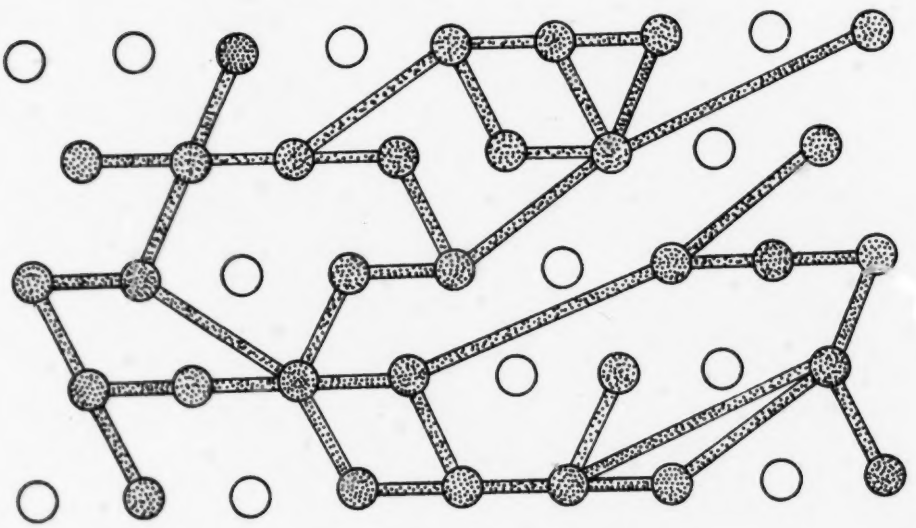
Linear. Learners follow a specified progression of units. Choices or variations in the specified sequence are unusual.



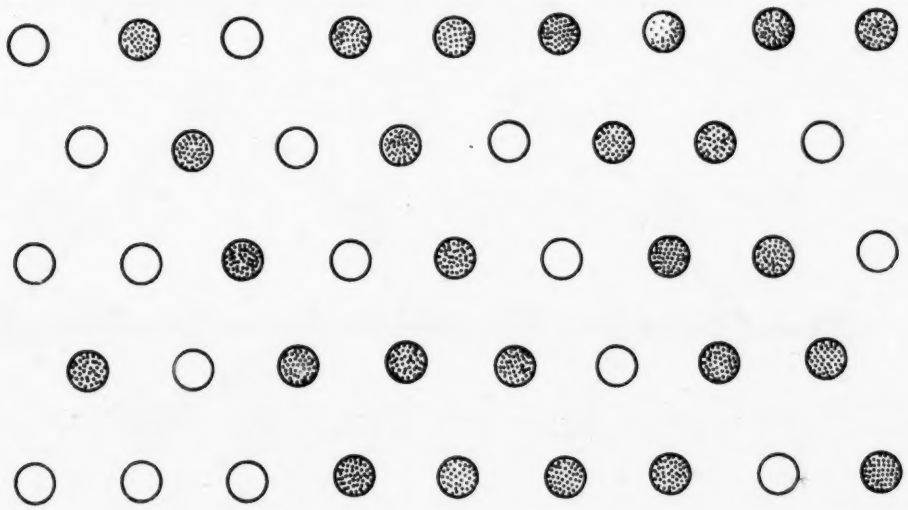
Branched. Alternative paths are available to learners. Each time a choice is made among alternative units, that choice directs the learner to a progression of ordered units or topics.



Network. Learners may proceed through units in a variety of ways. For each unit to be studied there are usually alternative sets of required units. There are more alternative routes in a network sequence than a branched sequence.



Nonspecified Sequence. Learners may proceed through units in any order.

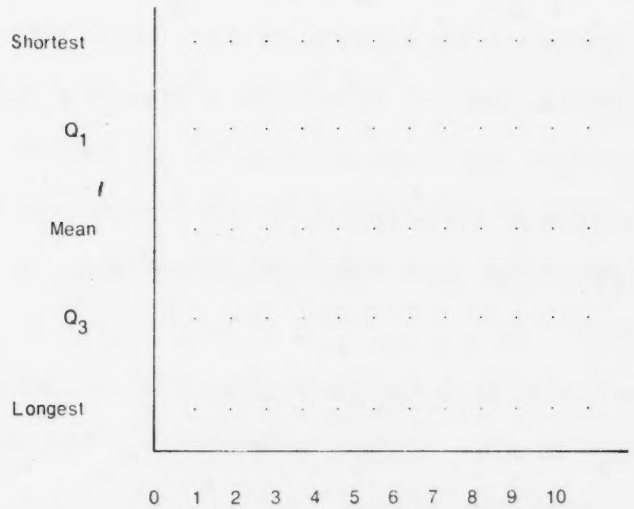


USE OF INFORMATION

The Use of Information Scale provides a percentage estimate of the degree to which the sequence of units is prescribed on the basis of some information.

RATE

Rate Variability Observed



Number of Units Completed

RATE

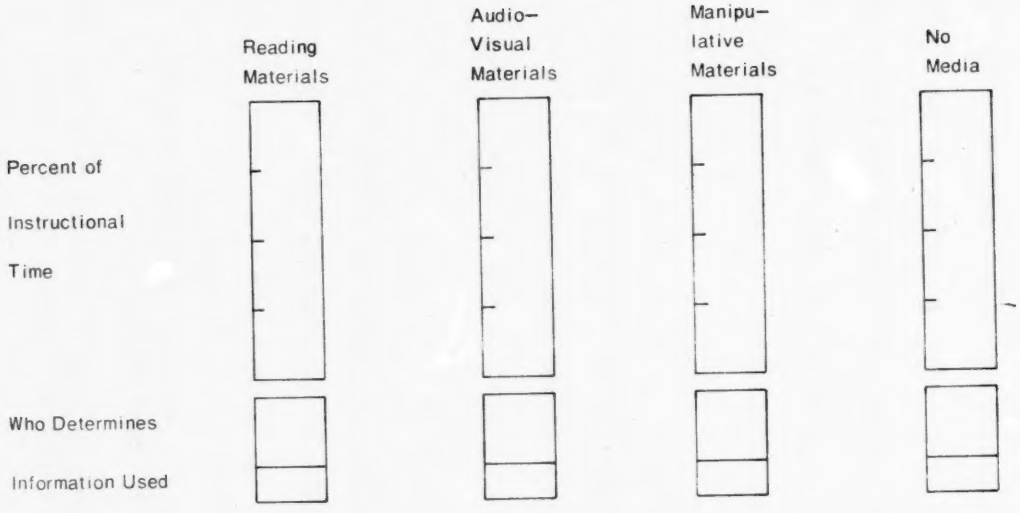
The Rate component examines the relative lengths of time learners spend with the instructional program. The rate at which a learner passes through a program depends both on the variety of options the program makes available to him and on the speed at which he works. The Rate Component measures the extent of variation in learner progress which results from a combination of program options and individual differences.

The graph relates learner progress through the program to the number of units (however defined for each program) completed. Results shown may be for a sample of learners or for an entire population. The five lines indicate units mastered by the slowest and the fastest single learners observed, together with three intermediate measures: the first and third quartile points and the mean for all learners. The numbers shown as "Numbers of Units Completed" are intended to provide only a relative scale of the units completed by learners.

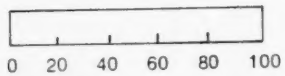
Color Coding

The horizontal bars are drawn using color to indicate who determines the rate at which learners progress. Red denotes learner; blue, instructor; and yellow, program.

MEDIA



Use of Information in Prescribing Media:



MEDIA

The Media component describes the different kinds of materials or other learning situations being used to present the subject matter to the learner and identifies the amount of time (as a percentage) learners spend with the materials and other learning situations. The use of media is also related to the management of the program, through an identification of who determines media use and an examination of the role of information in decisions about media use. The two dimensions on the cover sheet relate types of media to usage.

CATEGORIES OF MEDIA

The four general categories used to designate types of media represent aggregates of the many possible ways instruction can be presented. Following are the four general categories and representative media that each includes.

Reading and Writing Materials refers to duplicated or printed materials. Examples of Reading and Writing Materials are:

Text. The written materials which are part of an adopted text or program.

Multitext. Written materials from more than one program, or from alternative texts.

Programed Material. Written materials presented in a program format, whether linear or branching.

Learner or Instructor Written Materials. Materials written by learners or instructors on related topics which are read by other learners in the program.

Computer Terminal. Learner reading and reacting to computer print-outs on teletype or screen.

Worksheets or Workbooks. Use of printed materials with paper and pencil.

Audio Visual Materials are mechanical devices used to present information to learners. Examples of Audio Visual Materials are:

Films. Reel or cassette.

Filmstrips.

Audio-tapes. Reel or cassette.

Records.

Overhead projector. Used to display previously prepared (perhaps commercial) overlays.

Video-tapes. Reel or cassette.

Manipulative Materials denotes materials which the learner handles in the course of instruction. With these materials, instruction is seen as occurring through the manipulative process. Examples of Manipulative Materials are:

Building Tools. Art materials, crafts, wood and metal and other expendable materials used for construction.

Games. Puzzles and contests which are used for instruction.

Two Dimensional Materials. Flannel board, tanagrams, construction paper and other flat materials which are manipulated by learners.

Three Dimensional Materials. Models, forms and solid materials which are manipulated by learners.

No Media describes instances when instruction is communicated principally without the use of media. Examples of instructional situations where materials are not the central focus of instruction are:

Discussions. Learners getting together with or without instructors for the purpose of communicating to each other. These may include seminars, conferences, or other situations where there is verbal information.

Lecture. An instructor or learner giving information to a group of learners.

USES OF MEDIA

Three aspects of use of media are shown. The first is the percentage of instructional time learners spend with each type of media. The profile shown here reflects class variation but does not address the issue of potential variation in media for given learners within the program.

The participant in instruction who makes the decision that learners will use a particular type of media is also identified. The decision may be made by the program (shown in yellow) as in instances where there are no choices among modes of presentation, the learner (red) or the instructor (blue). Responsibility for the decision may be shared, in which case an estimate of relative contributions to the decision is shown in the color-coded box for Who Determines. If any written records concerning the program or the learner are consulted in choosing the media, the box labelled Information Used is filled in. Green is used to designate information consulted.

USE OF INFORMATION

The Use of Information Scale provides a percentage calculation of the degree to which instructional media is prescribed to learners on the basis of some information.

COLOR CODING

Green is used to identify uses of media and the use of information to prescribe media in the Media component. Color coding is used in the component only to show which participants in instruction

determine that learners will use a particular type of media. The percent of instructional time for each type of media is shown in green. If information is used in making decisions regarding type of media, green is shown in the boxes for Information Used. The participants who determine media type are identified through color coding for learner (red), instructor (blue) or program (yellow). If the decisions are shared, proportional shares of the decision are reflected by the coloring. The green showing Information Used is colored in coordination with the coloring for Who Determines, to indicate which of the participants in decision making have used information.

GROUPING

	SELF			SMALL GROUP		MEDIUM GROUP		LARGE GROUP	
	alone	with inst	with peer	W/O inst	with inst	W/O inst	with inst	W/O inst	with inst
Percent of Instructional Time									
Who Determines Information Used									

Use of Information in Prescribing Grouping:

0 20 40 60 80 100

% of Time

GROUPING

The Grouping component describes the patterns of association with other individuals which learners experience within the program. It also identifies certain size characteristics of the various groupings in the program. The use of groups of different sizes are reported as a percentage of total instructional time. The use of groups is also related to management of the program through an identification of who determines the association with other individuals and an examination of the role of information in prescribing grouping.

SIZES OF GROUPS

Four size categories are represented, depending on the number of learners participating in a given instructional activity. The categories are further subdivided to show which of the groups are working with an instructor and which are working without an instructor. The subdivisions create a total of nine categories for describing grouping.

The size categories are:

Self. One learner. The three association categories are: (a) acting alone, (b) alone with an instructor, or (c) alone with a peer who serves as a tutor.

Small Group. Two to seven learners working together. The two association categories are with an instructor or without an instructor.

Medium Group. Eight to twenty learners working together. The association categories are with an instructor or without an instructor.

Large Group. Twenty-one or more learners working together. The association categories are with an instructor or without an instructor.

LEARNER GROUPING CHARACTERISTICS

Three characteristics of the grouping of learners are shown in addition to the size association features of the groups. The first is the percentage of instructional time learners spend in each size group. The sum of all percentages shown in the nine categories should equal 100. The variation in size shown here reflects class variation but does not show potential variation in group size for an individual learner in the program.

The participant in instruction who makes the choice to use a particular group size is also identified. The decision may be made by the program (as in instances where there are no personal choices among group sizes), the learner or the instructor. Responsibility for the decision may be shared, in which case an estimate of relative contributions to the decision would be shown in the color-coded box for Who Determines.

If any written records concerning the program or the learners are consulted in choosing grouping size, the box labelled Information Used is filled in. No refinements are made in judging the percentage of decisions for which information is used.

USE OF INFORMATION

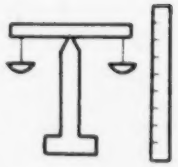
The extent to which information is used in making all decisions regarding grouping sizes is recorded as a percentage.

COLOR CODING

Green is the predominant color used in completing the Grouping Component; the only use of color coding is for indicating who determines grouping size. The percent of instructional time in groups of each size

is shown in green. If information is used in making decisions, green identifies the group sizes determined on the basis of information. The entire box is colored, if any information is used to form groups of a particular nature. Who determines is color coded for program, learner and instructor. If the decisions are shared, proportional shares of the decision are reflected by the coloring.

LEARNER ASSESSMENT PROCEDURES



Information About Each Learner As:

	Skill and Concept Holder	Interest and Attitude Holder	Construction Maker	Interpersonal Relator
Is assessed	☐	☐	☐	☐
and Recorded	○	○	○	○

By the Following Procedures:

Testing				
pre	☐ ○	☐ ○	☐ ○	☐ ○
mid	☐ ○	☐ ○	☐ ○	☐ ○
post	☐ ○	☐ ○	☐ ○	☐ ○
Conferences	☐ ○	☐ ○	☐ ○	☐ ○
Products	☐ ○	☐ ○	☐ ○	☐ ○
Other Observations	☐ ○	☐ ○	☐ ○	☐ ○

LEARNER ASSESSMENT PROCEDURES

The Learner Assessment Procedures component describes the types of information obtained about the learner's interaction with the objectives of the instructional program. The procedure which generates the information and the type of information obtained are both presented. The recording of information is documented also. The first dimension on the cover sheet identifies information about each learner in four different kinds of roles in which a person may be involved. The roles identify the learner as: skills and concept holder, interest and attitude holder, construction maker, and interpersonal relator. The second dimension indicates whether the information is obtained (and if it is recorded) by testing, conferences, products, or other observations.

INFORMATION ABOUT EACH LEARNER

Four types of information may be obtained about learners.

Learner as skills and concept holder. Skills and concepts are often referred to as the content or the subject matter of instruction. Information may be obtained about the skills and concepts which a learner possesses at a certain time.

Learner as interest and attitude holder. Interests and attitudes are the feelings and emotions which a person has. Information may be obtained about the interests and attitudes which a learner has towards schooling tasks, program goals and himself.

Learner as construction maker. Constructions are tangible and concrete products which are created by a person. Products in reading, mathematics or teacher education programs may look quite different,

ranging from picture books to simple dictionaries, mathematical models to videotaped micro-teaching sequences. Information may be obtained about the creativity and productiveness of a learner.

Learner as interpersonal relator. Interpersonal relations are the ways a person conducts himself with other people. Information may be obtained about how a learner treats other people, works, plays or reacts with other people in specific situations.

PROCEDURES FOR OBTAINING INFORMATION

Assessment information may be secured in a variety of ways. The indicators at the top of each of the four columns signal whether any information of that type is obtained for learners. Greater detail on the source of the information is presented in the column. Four types of procedures for gathering information are examined:

Testing. The program may include a number of options for assessment as a learner progresses through a unit. The designations in this category apply to assessment devices applied within the instructional units in the program.

Pre. Pretests are taken by the learner prior to engaging in instructional activities for a unit. For example, the intent of a pretest based for skills and concepts is to determine the learner's readiness for the unit or his prior knowledge of the information contained in the unit.

Mid. Midtests include any assessment of the learner undertaken while he is engaged in the study of a unit. For example, the intent of a midtest used for skills and concepts covers the material contained within that unit.

Post. Post tests are taken by the learner at the conclusion of a unit. For example, the intent of a post test used for skills and concepts is mastery of the material studied.

Diagnostic tests may be termed post tests if the learner can use them to secure exit from the unit.

Conferences. Direct conversations between learner and instructor or staff may be a part of assessment procedures. When the intent of the conference is to review learner progress or determine learner needs, it may be cited here as an assessment activity.

Products. When work done by the learner is directly examined to assess learner progress, products may be considered part of assessment procedures. Products may include such diverse items as videotapes of learner performance in a teaching role, murals, models or costumes. Like other assessment activities, this product may or may not be recorded or kept.

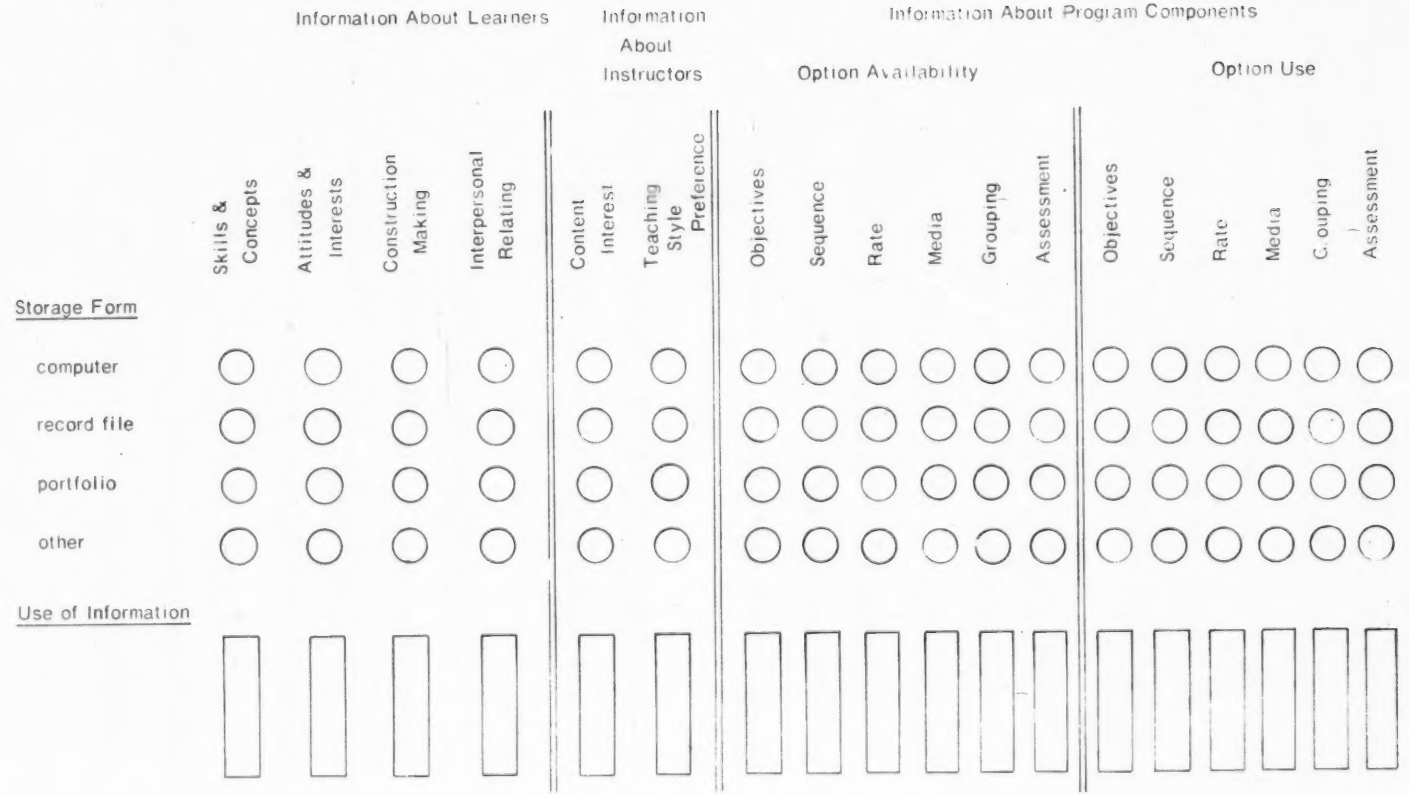
Other Observations. Other observations which might be a part of assessment could include general IQ or achievement testing; records of concepts, skills, products or attitudes which the learner has shown outside of school; vocational interests or family background.

COLOR CODING

All rectangles used as indicators in this component are color coded to learner (red), instructor (blue), or program (yellow) on the basis of who determines when or that a particular type of information shall be obtained. In the case where the decision is a joint one, multiple coloring is used.

Circles represent the recording of information. If information is recorded, they are always colored green. If some information of a particular type is recorded and some is not, the circle may be shown as partially colored.

MANAGEMENT OF INFORMATION



MANAGEMENT OF INFORMATION

The Management of Information component relates to the manner in which the program records and uses information about learners, instructors, and options within program components. Storage form and information use are established for each category of information. Types of information are separated into four classifications for learners, two for instructors and two major classifications for instructional components.

CATEGORIES OF INFORMATION

Information about learners, instructors, program options and program use comprise the major headings for types of information.

Information About Learners. The four types of information listed for learners are the same as those cited in the Learner Assessment Component. They identify the presence of information regarding the learner as:

Skill and Concept Holder. Understandings of the subject matter displayed by the learner as each learner progresses through the program.

Interest and Attitude Holder. Feelings and emotions which a learner has shown while progressing through the program.

Construction Maker. Creative abilities and productivity displayed by each learner as each progresses through the program.

Interpersonal Relator. The ways a person conducts himself with other people, works, plays or reacts with other people as each learner progresses through the program.

Information About Instructors. Programs may identify special information about participating instructors. Two types of information about instructors are distinguished here:

Content Interest. Special interests, continuing questions or enthusiasm about specific aspects of the content to be instructed. These interests may be evident from the instructor's own past formal educational experience or they may have arisen from other activities.

Teaching Style Preference. The teaching-learning style which different instructors use or want to use. Styles may relate to preferences for group size or kinds of personal interactions with learners.

Information About Program Components. For the five instructional components (Objectives, Sequence, Rate, Media, Grouping) and for the Learner Assessment component, this section identifies whether any information is provided for Option Availability and for Option Use. The first category would indicate availability of information regarding choices the program offers within each component. Option Use indicates if a record of the choices made is kept and available for reference.

STORAGE AND USE OF INFORMATION

The above information may be kept and used in a variety of ways. The second dimension of this component indicates the forms in which the kinds of information are kept and who makes use of the information.

Storage Form. Information may be stored in one of the following ways:

Computer. Stored in computer which must be accessed by electronic equipment.

Record File. Typed or handwritten records, stored on paper files or posted.

Portfolio. Folders containing a variety of information, a variety of products, including examples of work, for participating individuals or for aspects of the program.

Other. Any alternative form of storage. For example, a student or teacher manual.

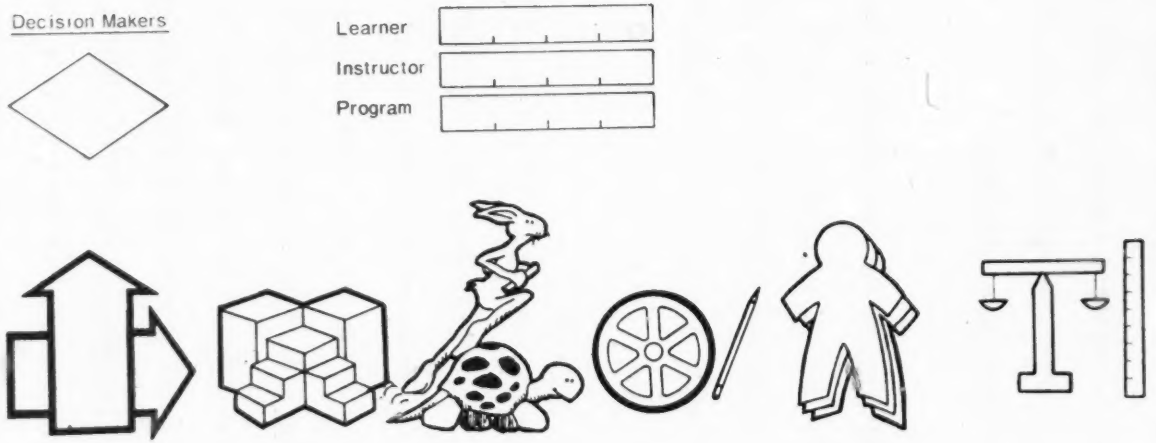
Use of Information. Each type of information obtained about learners, instructors or program may be used by any of the participants or by the program. This category identifies all users of the information also showing the proportion of the use.

COLOR CODING

All circles are colored in green. If any information in one of the categories is kept using any of the available forms of storage, the circle is entirely colored in.

The rectangles showing use of information may be partially colored in, to reflect the percentage of time a given type of information is used. Rectangles are colored to show the decision maker using the information (learner, red; instructor, blue; program, yellow) and may include more than one color.

MANAGEMENT OF INSTRUCTIONAL COMPONENTS



MANAGEMENT OF INSTRUCTION COMPONENT

The Management of Instruction component characterizes the process by which available resources are allocated to learners to achieve instructional objectives. This component summarizes the percentages of decisions made by learner, instructor and program and identifies the management style of each instructional component.

Decision Makers

Any participant in instruction has the potential for making decisions. The graphsshown for decision makers represent a summary profile of results from all of the decisions made within a program. The total allocation of decisions among program, learner and instructor should total one hundred percent.

Management Style

Management style indicates the extent to which the handling and scheduling of instructional resources and their use involves a deliberate effort. It suggests both the time and the nature of the process of bringing together learners and the program. The management style for each instructional component should be distributed among the three alternatives so that the total colored in is equivalent to one hundred percent. The six instructional components are Objectives, Sequence, Rate, Media, Grouping and Assessment. The three options shown are:

Formal. The resolution of resource choices is a defined, documented process. Resources for learners are prescheduled and fixed.

Informal. The procedures employed in relating learners to resources need not be uniform or documented. Planning sessions are used to identify the resources available to the learners.

None. Resources are generally available to learners (as in an instructional resources center) to use at will, but the availability of resources is not affected in advance by knowledge of probably demands or use of resources.

Record of Use.

If the way resources are handled is monitored and then examined, either to determine usage or to review the operation of the total program, this circle is colored. For each of the instructional components, this measures a recording of the scheme of which all participants in the program are brought together.

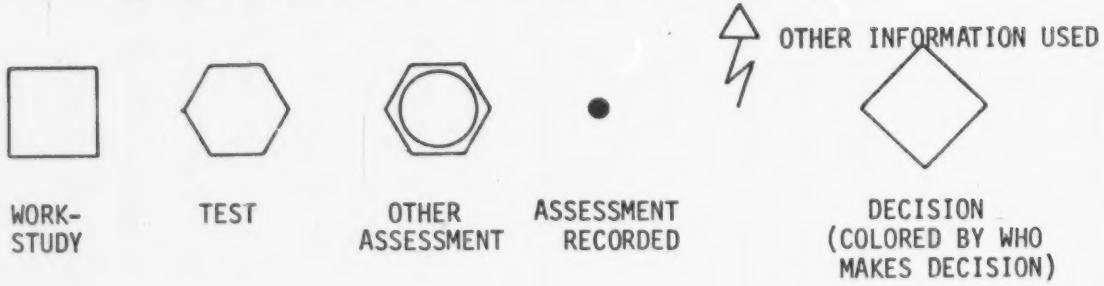
COLOR CODING

The information identifying decision makers and management style is color coded by responsibility for making decisions. Colors for the three decision makers should total one hundred percent.

For coloring management style, program, instructor or learner may be shown to have responsibility for any of the styles with any of the components. Shared responsibility is shown by the proportions of color. Total responsibility for each component should equal one hundred percent.

Record of Use is always shown in green, with no partial coloring, if any recording of the management process occurs.

PROGRAM PATTERN



PROGRAM PATTERN

The Program Pattern component describes the learner's progress through an instructional unit. The intent of this component is to describe the instructional procedures which are repeated for each unit. It offers two features not included in other components. It describes the possible flow of the instructional procedures followed by a learner. It also indicates the relationship between a learner's instructional activities and the assessment which may follow or precede these activities.

Flowchart symbols trace the sequence of instructional procedures available to a hypothetical learner. Because the intent of the component is to provide a description which could apply to each learner's progress through a unit in the program, a flowchart is used. The flowchart may, for example, indicate options to by-pass instructional activities if those options are available. The component highlights the placement and determination of decisions as a part of the program, by color coding the decision symbol in order to show whether the choice is made by learner, instructor or program, or a combination of these.

The following symbols are used together with a flowchart diagram to show the sequential steps:

Work-Study Activity. Any instructional activity that the learner performs. These activities are further described in the Media and Grouping components. If there is more than one instructional activity from which to choose,

this multipicity of instructional activities is shown by including more than one square.

Assessment Activities. Any activity which is used to monitor a learner's interaction with instructional material. Results of these activities are described in the Learner Assessment component. Assessment activities may be represented as tests or other activities. In each case they may be recorded or non-recorded. In the event the assessment is recorded, a black dot is included inside the hexagon. If the assessment is personal (seminar or conference) rather than mechanical (paper and pencil or machine), a small circle is drawn inside the hexagon.

Decision. A place in the instructional procedure where a choice is made. The choice may determine what the next instructional activity or assessment may be. This symbol is color coded to identify the decision maker(s), learners (red), instructor (blue), program (yellow).

Other Stored Information Used for the Decision. The use of information in a decision may include consulting learner records, files of past work or statements about program alternatives. This symbol denotes the accessing of such recorded information to assist in making a specific instructional decision.

Descript
Indivic

KEY

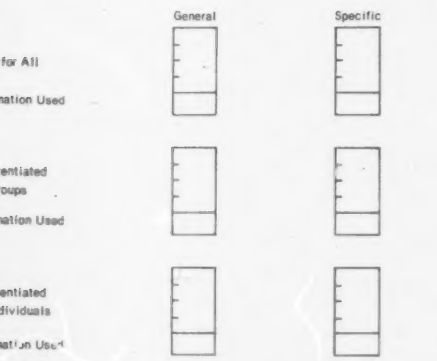
- Learner determined
- Instructor determined
- Program determined
- Appropriate program descriptor

PRELIMINARY PROGRAM DESCRIPTORS

| | | |

escriptor for the Analys
Individualized Instructio

OBJECTIVES

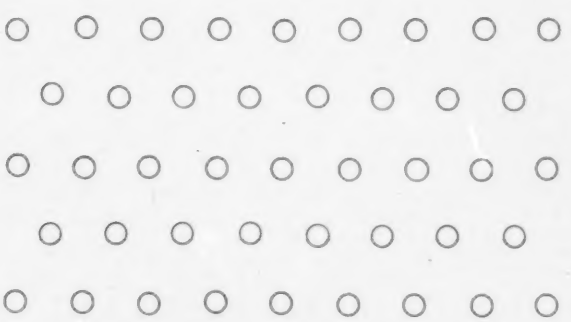


Use of Information in Prescribing Objectives:

0 20 40 60 80 100

% of Instruction

SEQUENCE

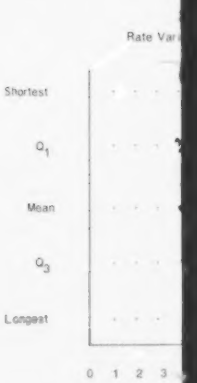


Use of Information in Prescribing Sequence:

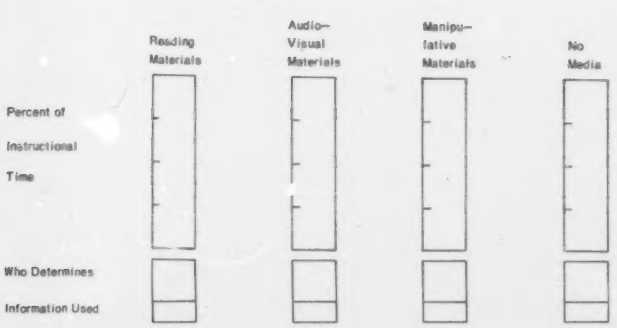
0 20 40 60 80 100

% of Instruction

RATE



MEDIA

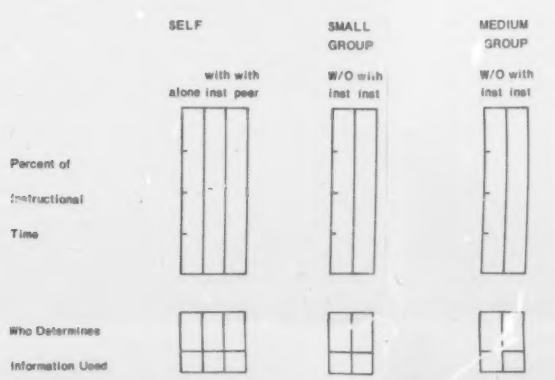


Use of Information in Prescribing Media:

0 20 40 60 80 100

% of Instructional Time

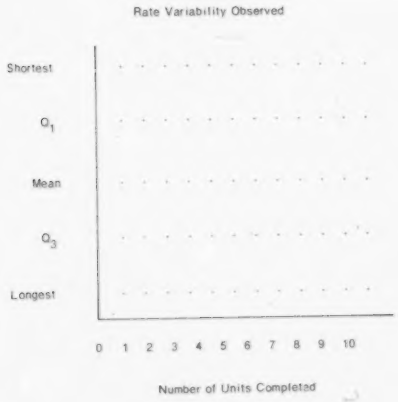
GROUPING

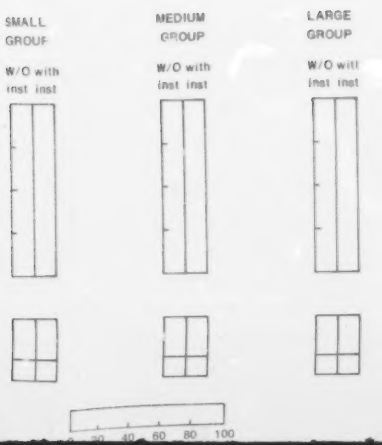


Use of Information in Prescribing Grouping

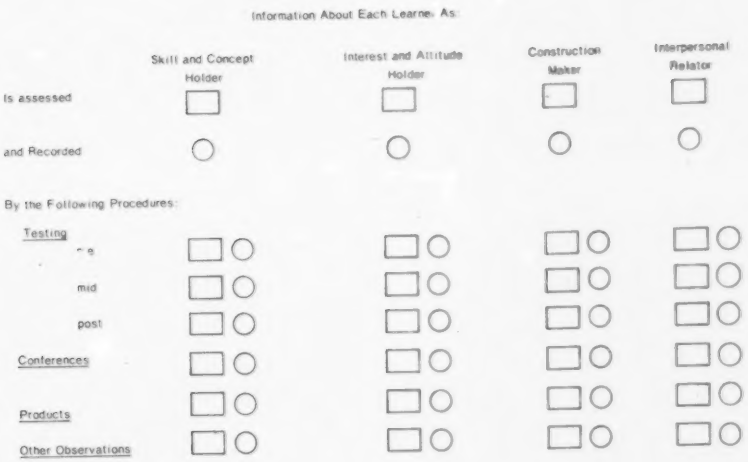
nalysis of uction

RATE

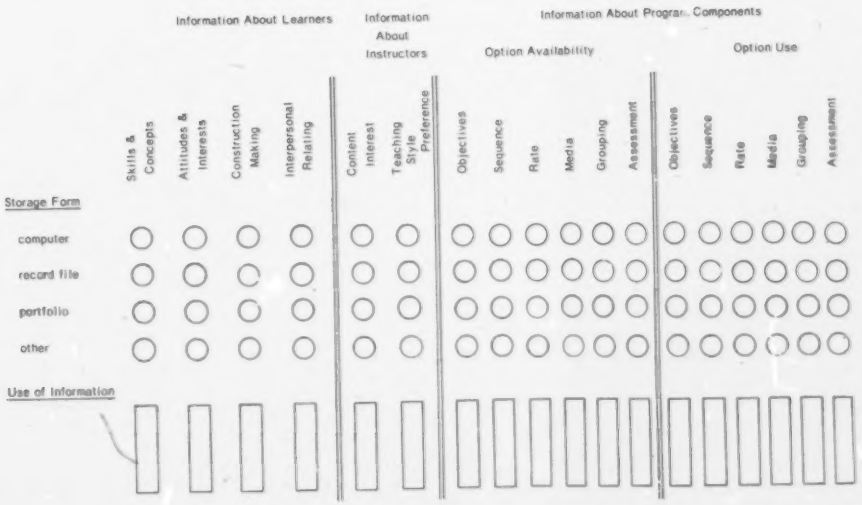




LEARNER ASSESSMENT PROCEDURES



MANAGEMENT OF INFORMATION



MANAGEMENT OF INSTRUCTIONAL COMPONENTS

Appropriate program descriptor

PRELIMINARY PROGRAM DESCRIPTORS

Source of Data	functioning program	perception of functioning program				ideal program				developer intent						
		tchr.	adm.	supr.		tchr.	adm.	supr.		simls.	mls.					
Production Agency	local schools	educational agency				commercial agency										
DESIGN CHARACTERISTICS																
Subject Matter	mathematics	reading				teacher education										
Grade Equivalents	P	K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Packaged as	modules	tests				multi-texts										
Learner Arrangement	alone	fixed groups				changing groups										
IMPLEMENTATION CHARACTERISTICS																
Grade Equivalents	P	K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Learner Arrangement	alone	fixed groups				changing groups										
Staff Arrangement	teacher	teacher group				specialist(s)				aide(s)						
Learner Time	unscheduled	scheduled/fixed				scheduled/flexible										
Space Arrangement	open	multiple rooms				single room										

WISCONSIN CENTER FOR THE ANALYSIS OF INDIVIDUALIZED INSTRUCTION

SCHOOL OF EDUCATION
UNIVERSITY OF WISCONSIN-MADISON

M. Vere DeVault
Mary A. Golladay
C. Thomas Fox, Jr.
Karen Skuldt

Visual Design by: G. F. McVey and J. Fritsch

	General	Specific
Same for All		
Information Used		
Differentiated for Groups		
Information Used		
Differentiated for Individuals		
Information Used		

Use of Information in Prescribing Objectives:

0 20 40 60 80 100

% of Instruction

MEDIA

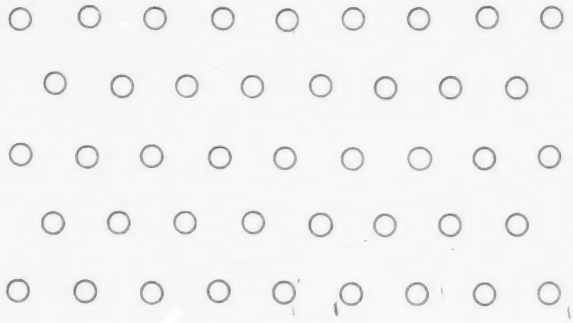
	Reading Materials	Audio-Visual Materials
Percent of Instructional Time		
Who Determines		
Information Used		

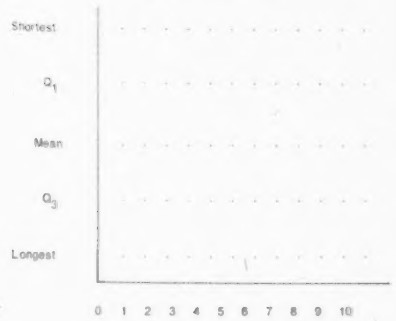
Use of Information in Prescribing Media:

0

PROGRAM PATTERN

Specific





g Objectives:

0 100

LINEAR BRANCHED NETWORK NONSPECIFIED

Use of Information in Prescribing Sequence:

0 20 40 60 80 100

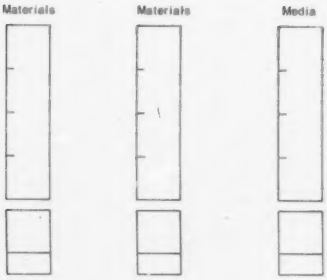
% of Instruction

GROUPING

Audio–Visual Materials

Manipu–lative Materials

No Media



ng Media:

0 20 40 60 80 100

% of Instructional Time

SELF

SMALL GROUP

MEDIUM GROUP

LARGE GROUP

with alone

with inst

W/O inst

with peer

with inst

W/O inst

with inst

W/O inst

with inst

W/O inst

Percent of Instructional Time

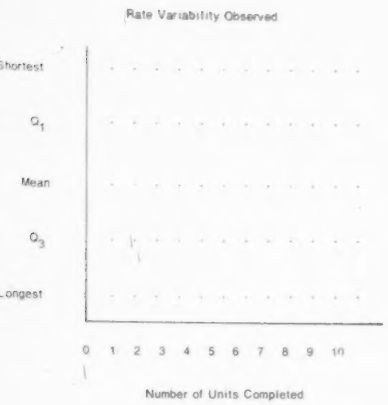
Who Determines Information Used

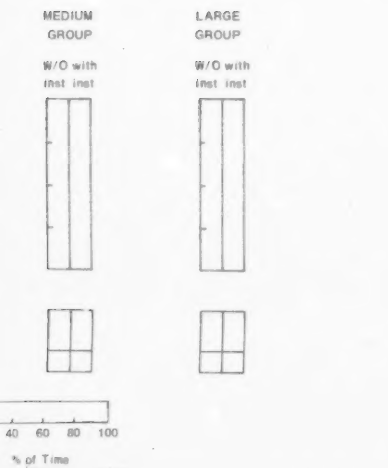
Use of Information in Prescribing Grouping:

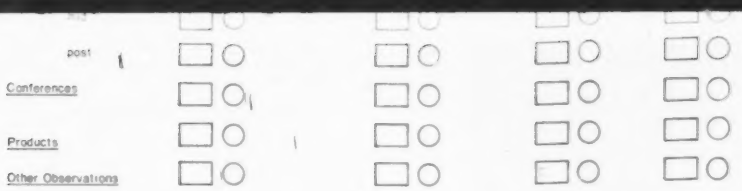
0 20 40 60 80 100

% of Time

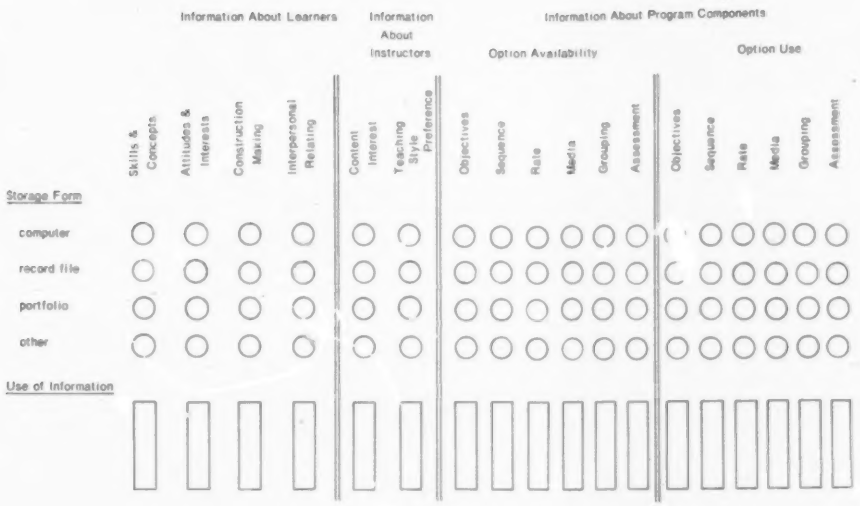
TERN



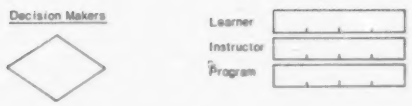


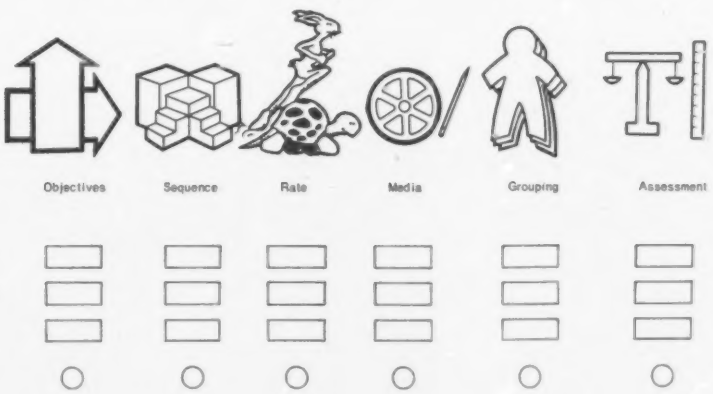


MANAGEMENT OF INFORMATION



MANAGEMENT OF INSTRUCTIONAL COMPONENTS





IV. FIELD TESTING PROCEDURES

INTRODUCTION

At the time the proposal for the present research effort was submitted, it was apparent that the specific components of the system must be developed and that once those components had been developed independent of one another, they would need to be put togehter and field-tested as a total Descriptor system. This section describes the intent of the field tests and identifies the locations for the field tests.

DESCRIPTOR FIELD TESTING

The original proposal called for a full-scale field-test program for the Spring of 1973. The purpose of the Descriptor field-test was to determine the utility of the instrument in describing individualizing aspects of programs in mathematics, reading, and teacher education. The instrument was developed by a group of mathematics educators and initially represented that focus. Specialists in reading and in teacher education were added to the continuing development team and field-testing was carried out in programs of all three types.

A second purpose of the field-test was to determine the utility of the Descriptor for a variety of uses. Of the several ways the Descriptor can be used, three which represent this variety were selected for field-testing. The first use for which the Descriptor was field-tested was simply to describe functioning individualized programs. In this use data were collected from persons who were involved directly in the day-to-day instructional operation of the program. Data collection procedures included discussions primarily with teachers but with enough student input to verify some of the data provided by the teachers.

A second use of the Descriptor in the field-test study was for comparison. In this use, the programs were described in two ways. The first was simply a description of an on-going program in the same sense as that described above. The second Descriptor was prepared to present evidence of long range goals or the ideal program that was envisioned. Throughout the country, schools are experimenting with designs for individualizing instruction. It is probably safe to say that at no time did the WCAII staff meet with a staff either informally, through written correspondence, or through formal data collecting procedures that had developed an individualized program with which they were satisifed. Rather, the present state of individualizing instruction throughout the country is dynamic and process oriented. Thus, it seemed obvious that one major use of the Descriptor should be that of comparing present practice with projected plans. In this sense the comparison use may well serve to be the most helpful one. Even in describing a functioning program at a single point in time, it was recognized that the program at the time of a first observation was not expected to be typical practice a few weeks or months hence.

In the comparison use, teachers and students provided data for the description of the functioning program but frequently other staff members provided the data for the goal statements. This was particularly true in

the teacher education field-test sites. Although school-developed programs were usually the products of the teachers who were instructing the program once it was developed, in teacher education sites the WCAII staff found that often instructors understood the functioning program better than did administrators responsible for the program. Likewise, instructors involved in the day-to-day operation of the program were less likely to be knowledgeable about the comprehensive school-wide ideas about long-range planning for program development. Thus data were often collected from different sets of persons for goal statements than for the practice statements, especially in the teacher education sites.

The comparison use also helped determine the extent to which an existing program (practice) was consistent with the intent of the original designers of the program as explained in written descriptive materials (goals). Descriptive materials from developers (commercial agencies or federally funded projects, for example) were consulted to determine the correspondence of practice to the goals originally established for the program.

Hence the goals represented in the comparison use were of two different kinds. One kind of goal was intent of the faculty for program practice in the future. The other kind of goal was the intent of the designed and packaged materials that were being used to support an individualized approach to instruction. These two uses of the term "goal" are very different and each suggests different kinds of questions when compared to the corresponding "practice" of a functioning program. In this study, however, the term comparison meant simply that there were two descriptions of these programs, one of the way the program was functioning and one of the way in which the program was being designed to be functioning (either in the future by the faculty, or in the original intentions of the packaged materials).

Finally, the Descriptor was used for development. The development use represents a kind of extension of the comparison use in which those responsible for the development of a program saw the completed Descriptor as a source of information for use in the continuing development of their program.

The Development use resulted in the greatest variety of applications. In one instance there was no existing program, so plans for the individualizing characteristics of the program were formulated from work with the Descriptor. In others, there were only the beginnings of an individualized program at its initial stages of development. One program was fully functioning and the Descriptor in a developmental mode was used as a dissemination/diffusion instrument to provide needed information for those faculties wishing to implement the same or similar programs in their own schools.

IDENTIFICATION OF SITE LOCATIONS

A variety of sources provided input for site selection. Schools using nationally distributed programs were suggested through the respective program headquarters. Specialists in mathematics, reading, and teacher education provided valuable assistance. Published lists of programs under development[1] helped to identify exciting programs that are less well known.

The field test sites which were selected are shown in Figure 1. The two dimensions show the three subject areas with which the Descriptor was used: mathematics, reading, and teacher education; and the three purposes in each of the three kinds of sites: Description, Comparison and Development.

---

1. Many programs are identified in the references cited in the BIBLIOGRAPHY ON INDIVIDUALIZED INSTRUCTION under Individualized Instructional Programs, Appendix A of this report.

DESCRIPTOR USE MODE	*MATHEMATICS*	*READING*	*TEACHER EDUCATION*
DESCRIPTION	Sherman Elementary School Madison, Wisconsin Elementary -- Local	Parkview Elementary School Cedarburg, Wisconsin Elementary -- Local	Weber State College Ogden, Utah
	James Madison Memorial High School Madison, Wisconsin Secondary -- Local	Stillmeadow Grade School Stamford, Connecticut Elementary -- Local	University of Houston Houston Competency Based Teacher Education Center Houston, Texas
COMPARISON	Midland Elementary School Tacoma, Washington Elementary -- IPI	Mark Twain School Des Plaines, Illinois Elementary -- Scott Foresman	Illinois State University College of Education Normal, Illinois
	Prairie View Elementary School Cedar Rapids, Iowa Elementary -- PLAN*	McFarland Elementary School McFarland, Wisconsin Elementary -- IGE	Florida International University Miami, Florida
DEVELOPMENT	Trevor Browne High School Phoenix, Arizona Secondary -- Local	Leopold School Madison, Wisconsin Elementary -- Local	Southern University Baton Rouge, Louisiana

FIELD-TEST SITES -- PROGRAM TITLES AND SCHOOL LOCATIONS

Figure IV.1

V. VALIDITY AND RELIABILITY OF DESCRIPTOR USE

INTRODUCTION

The questions of reliability and validity have been addressed but not entirely answered in this study. Nonetheless, it should be recognized that the WCAII staff has been aware of the need to satisfy its own concerns about the validity and reliability of the instrument it has developed and used. Although it was not the intent of this project to undertake a large scale study of reliability and validity, a report of the successes and failures that the staff experienced in using the Descriptor as a measurement tool is included here.

Three kinds of validity are cited in this paper. The first is concerned with educational importance (face validity), the second with content validity, and the third with predictive validity. Substantial data have been collected to support the use of the Descriptor for the first two kinds of validation. Questions of concurrent validity and of construct validity must await further Descriptor use.

Reliability has been addressed in the context of reducing sources of error. To reduce sources of error the WCAII staff has given much attention both to the techniques they have used with the Descriptor and to the terminology used. Both questions of reliability are addressed here.

RELEVANT TASKS UNDERTAKEN

The validity of Descriptor use has been determined as a result of several aspects of our on-going work throughout the development and field test of the Descriptor. Specifically, information has been gathered and is reported here in terms of (1) responses of consultants, (2) review of literature, (3) revisions following component field test, (4) appropriateness to programs observed, (5) responses from field test personnel and (6) revisions following Descriptor field test.

Information relative to each of the components of the Descriptor has been obtained from one or more of the information sources identified above. Although hard objective data have not been obtained, WCAII staff have confidence in the validity of the instrument at a number of points based on experience with the Descriptor over two years. Not to share that information with users would be to deny them of much of the richness of the experience the staff has had. In some instances the staff is quite certain of the validity of the instrument or of a specific part of the instrument and in other instances they are less certain or sense a lack of validity. These subjective insights are provided in this report. The organization of the discussion follows the sequence of data sources reported here.

Responses of Consultants. Consultants from among the University of Wisconsin faculty and visitors were used at several points along the way to provide a more objective review of progress than could be obtained by WCAII staff directly and continuously involved in project development efforts. Details of these consultant meetings have been reported elsewhere. Here it should be noted that these meetings were spaced over time; addressed specific and varied questions; and included persons with specific and varied expertise. Curriculum theorists, teacher educators, school personnel including supervisors, administrators, and teachers were included in these meetings to provide the WCAII staff with reviews of progress from the several perspectives represented.

Revisions Following Component Field Tests. During the fall of the 1972-73 school year the WCAII staff worked extensively in one school to determine the extent to which the individual components of the Descriptor could be used to reflect the nature of on-going individualized programs. Substantial revisions resulted from these efforts which provided staff members with some sense of the utility of particular components and the several dimensions of questions which were to be answered with that component.

Appropriateness to Programs Observed. A major question posed during the field test activities was whether the Descriptor would be appropriate to the program reviewed. Early in the development of the Descriptor it had been decided that "system oriented" programs were of the type for which the Descriptor was appropriate. It seemed during the developmental stages that more informal, non-structured individualized programs would require a substantially different kind of Descriptor format.

The selection of sites, then, was limited to programs of a particular type -- a type WCAII staff members thought to be most representative of individualizing efforts in schools and colleges.

Responses from Field Test Site Personnel. A major purpose of the field test activity was to determine the reactions of personnel at the field test sites to the Descriptor's report of their program. It was recognized that permission to visit a field test site had been granted for a variety of reasons. In few instances was the decision based on prior knowledge of the nature of the program to be visited. The fact that the site had been recognized and invited for participation in a national study probably prompted many sites to reply in the affirmative. The staff was particularly careful, therefore, to observe the extent to which site personnel believed the picture developed by the Descriptor was true of their program and particular attention was given to determine which components seemed especially useful, correct or appropriate. In about two-thirds of the site visits, personnel were quite expressive of their belief that the Descriptor was appropriate, was accurate and did have a number of uses for their local staff.

Revisions Following Descriptor Field Test. The field test was undertaken with the edition of the Descriptor called Descriptor for the Analysis of Individualized Instruction. It had been used in a number of schools and it had been presented to a number of classes, seminars, workshops and faculty groups. The experience of the field test indicated that most of the "bugs" had been previously worked out of the system. Several refinements, however, were made as a result of the field test. These refinements are described elsewhere in this report and need not be discussed here except to make the point that changes related predominantly to data organization and coding rather than to inclusion or deletion of kinds of data or processes of data collection.

Special Reliability Study

One elementary school, organized around the multi-unit school concept and implementing Individually Guided Education, was used for a special study of reliability. The purposes of this special study were: a) to compare the interview technique used in the field studies with classroom observations, b) to compare a short one-to-one interview technique

with each teacher of a team with the group interview technique employed in the field studies and c) to compare different interviewees results with the short interview technique.

An associate member of the WCAII staff was employed to spend five weeks in the school in order to become as familiar as possible with the individualizing characteristics of the program managed by five teaching teams. This amounted to about one week per team. These weeks were spent observing the classroom activities of each team in each subject matter, listening to teacher conferences and meetings and occasionally talking to the teachers and students. After this extensive observation of each team, the staff associate completed Descriptors for the subject matter programs of each team.

In addition to this five week observation, there were two kinds of interview techniques undertaken by the WCAII staff. One interview technique was the group interview technique that was used by the staff in the field testing of the sites. This included a full day of interviews with groups of teachers from the same team, a completion of the Descriptor, and a second meeting with the entire team to analyze and change any items on the completed Descriptor.

A second interview technique was used for the other four teams. The second technique was an abbreviated interview of about one hour with one teacher and one interviewer. This abbreviated interview was conducted component-by-component and resulted in a Descriptor being completed for each interview. Three WCAII staff members conducted these interviews. Four teachers were used from each team, two to describe the math program, two to describe the reading program. Thus, from this second interview technique there were two Descriptors of the math program and two Descriptors of the reading program completed for each team.

The following comparisons were made of the Descriptors that resulted from the classroom observations, the field test interview technique and the abbreviated interview technique. First, the Descriptor from the classroom observation of team A was compared with the Descriptor from the field test interview of team A. Second, the Descriptors from the classroom observation of each of the four teams were compared with the corresponding Descriptors from the abbreviated interviews. Third, the pairs of Descriptors describing the same program of the same team but resulting from a different interviewer and a different team teacher were compared.

From this special study, the staff learned a great deal about the reliability of applying the Descriptor under a variety of conditions.

Discussion

The discussion of both the validity and reliability of the Descriptor draws almost entirely on the general and subjective impressions of the WCAII staff. While objective data of validity and reliabiiity are lacking, considerable thought and discussion has taken place among staff members these past several months. This discussion grows out of the experience with the Descriptor in both its formal and more informal uses over a period of nearly two years work.

VALIDITY OF DESCRIPTOR

Educational Importance

A central aspect of validity at the present developmental stage of the project is the educational importance, or face validity of the Descriptor. This importance is related to its use and can be viewed independently for each use -- Description, Comparison, and Development. The sense of educational importance for each use comes from a review of current literature, comments from consultants and contact with site personnel in the field test.

Description. The development of the Descriptor was initiated because of the importance attached to improved means of describing individualizing characteristics of instructional programs. Throughout the refinement of the instrument, analysis of the current literature and through the field-test activities there has been a growing awareness that the use of the instrument to describe particular features of individualized instructional programs makes an important contribution to current educational needs. It has proven in some instances (particularly with college and university programs) to be useful in communicating to students the intent of the program as it can be expressed in the Descriptor completed by the faculty. It has been useful to faculty as they have clarified their individual notions of their cooperative joint efforts to create and implement individualized instruction. It has been useful to outsiders interested in knowing more about specific programs and their characteristics.

Comparison. Many field test site personnel with whom the WCAII staff visited wanted to be able to compare their program with other programs, or to compare different commercial programs. Current literature reviews indicate a number of efforts addressing this need. The major information presently available on the Descriptor's use in comparison is in comparing the same program at two or more stages of development or implementation. The written intent compared with an operating program or the existing operation of a program compared with the future hopes for the program are the specific comparisons which have been made to date. For example, at one university, the faculty found it very useful to compare their version of their teacher education program on the Descriptor with the version their students had. Another valuable comparison for which the Descriptor was used was in comparing the ideal program of a staff with the actual functioning program.

Development. No individualized instructional program is fully developed. The validity of this statement can be shown in the current literature, correspondence with commercial agencies and contact with school personnel. From those same sources there are statements about the difficulties and complexities in attempting to develop an individualized instructional program. The Descriptor has been used with faculties to help them plot a series of steps to be taken in the development of their program. In one instance, a pair of teachers used the Descriptor to plan the future use of a commercial reading program. In another instance, a faculty developing a competency based teacher education program described their proposed program with the Descriptor and designed next steps in terms of this description. One important feature that the Descriptor provides a staff that is developing an instructional program is the opportunity to specifically describe the kind of program they want (their "ideal program"). Once a description of the ideal program is completed, appropriate realistic intermediary steps can be planned. The actual progress toward the ideal program can then be charted by comparing the functioning program after certain periods of time with the intermediary steps that were designed to be met.

Content Validity

Informal evidence of content validity is presented in Table 1. In the left-hand column are identified the components of the Descriptor and the sub-questions within each component. Across the top are the sources of data about the validity of each sub-question within each component. The pluses and minuses represent the general consensus of WCAII staff members concerning the responses for the terminology and organization represented by the sub-categories. The pluses represent positive responses, the minuses, negative responses.

Predictive Validity. Predictive validity is concerned with the appropriateness of the Descriptor for the uses that are made of it. In the field test it was used to describe, compare, and develop individualized programs. The WCAII staff has confidence in its appropriateness to describe functioning and ideal programs. We have less information on which to build such confidence for its use in comparison or development settings. Extended experience in its use for these purposes over time will be required to support a case for predictive validity. Such use is planned for the 1973-74 school year and predictive validity studies are being planned.

CONTENT VALIDITY OF DESCRIPTOR

Components \ Responses During Stages of Development	Responses of Consultants	Review of Literature	Component Field Tests	Appropriateness to Field Tests	Responses from Field Test Site Personnel	Descriptor Revisions After Field Test	Special Notes on Terminology and Graphics
OBJECTIVES							
categories of objectives	-	+	0	-	+	+++	does not include all possible categories
variation for learners	++	0	0	+	+++	0	not many programs visited addressed this possibility
determination	++	0	+	+	++	0	difficult to establish percentage
use of recorded information	++	0	+	+	++	0	
LEARNER ASSESSMENT							
categories of information	++	+	++	+++	+++	0	
variety of procedures	++	+	++	+++	+++	0	
determination	+	0	++	++	+	0	difficult to establish percentage
record keeping	++	+	++	+++	++	0	
PROGRAM CONTEXT							
focus	+	0	+	+++	+	+	
characteristics	+	+	++	+++	+	+	not complete
source of data	++	+	+	+++	+	+	
SEQUENCE							
identifying units	--	+	+	++ M -- R	++ M -- R	0	difficult for reading & some teacher ed. courses
types of sequencing	+	0	0	++ M + R	+++M + R	+	merely symbolic
determination	++	0	0	+++	+++	0	
RATE							
identifying units	--	+++	+	+++M + R	+++M + R	0	can be relatively objective in math and some reading skills

variation for learners	++	+++	+	+++	+++	0	
determination	+++	+	+	+++	+++	0	
MEDIA							
variety of media	++	++	++	+++	+++	+	very applicable to most individualized instr. programs
% of instructional time	+	+	+	+	+++	0	impossible to be exact
determination	+	+	+	++	+++	0	impossible to record percentage
use of recorded information	++	++	+	+	++	0	
GROUPING							
variety of groupings	+	+	+	++	++	++	
% of instructional time	+	+	+	+	+++	0	
determination	+	0	+	+	-	++	impossible to be exact
use of recorded information	+	0	+	+	+	0	impossible to record percentage
PROGRAM PATTERN							
order of activities	++	+	+++	+++	+++	0	easier to record and find agreement than expected
alternative routes	++	0	+++	+++	+++	0	
determination	++	0	+++	+++	+++	0	
RECORD OF INFORMATION							"other" usually means teacher guide or "student guide"
type of storage form	+	+	++	+++	+++	+	
categories of information	+	0	++	++	+++	+	"options used" & "instr. info" seldom recorded
USE OF INFORMATION							
determination	+	0	++	+++	+++	+	difficult to record as percentage
categories of information	+	+	++	+++	+++	+	

scale: +++ = very positive ++ = positive, + = moderately positive

0 = none

--- = very negative, -- = negative, - = moderately negative

M = mathematics

R = reading

TABLE V.I.

RELIABILITY OF DESCRIPTOR

Although the results of the special reliability study were not in the form of "hard data" that were capable of being statistically compared, the staff did learn a great deal about the extent to which one can limit the sources of error in completing the Descriptor. Generally, these include the sources of error that may come through a faculty interview technique and the sources of error that may come through the use of unfamiliar terminology.

The abbreviated interview was not sufficient. Neither the teachers nor the interviewers were comfortable with the quick independent decisions that had to be made in this interview, nor did the results on the Descriptor prove particularly reliable. The terminology of the Descriptor, the extensiveness of the scope and the complexity of the programs it is attempting to describe do not lend themselves to a quick interview technique.

The extended one day interview of groups of teachers that was used in the field test sites compared favorably with the classroom observations. In fact, the teachers of this team and the WCAII staff members felt that the few differences in the results of the Descriptor favored the interview technique over the classroom observation. The reason for this was that the observation was made during one week while the interview covered the activities for a full semester.

The results from this special reliability study suggested very strongly that an extensive interview technique with groups of teachers participating in the same program used with feedback of the results on the Descriptor and further revisions, will produce a description of an individualized instructional program that can be supported by extended classroom observation.

CONCLUSIONS

There seems to be ample evidence of an informal nature that the Descriptor in its three uses is both valid and reliable. It does serve important educational needs and it does describe programs as they exist in the schools. Notwithstanding the extensive terminology used in conjunction with the Descriptor, there is evidence to support the reliable use of that terminology through the interview techniques which have been developed and used.

The WCAII staff does not hesitate to suggest the use of the instrument as it has been intended. Certainly there are a variety of ways in which the Descriptor can be abused. The recommendation is that it be used with the kinds of individualized programs for which it was designed and that it be applied to specific individualizing strategies rather than being used across programs or elements of programs which in their instructional strategies and materials differ substantially.

VI. CONCLUSIONS FROM FIELD TEST

INTRODUCTION

The Descriptor was designed for three major uses: description, comparison and development. During the field tests, it was applied to each of these uses for the subject areas of mathematics, reading and teacher education. This section offers a brief analysis of the three uses of the Descriptor and its applicability to subject areas on the basis of experience from the field tests, some suggestions for the data gathering techniques to be used in future applications of the Descriptor, and a statement about the limitations which must be placed on the use of the Descriptor.

APPLICABILITY OF THE DESCRIPTOR FOR DIFFERENT USES

The Descriptor was designed for three major uses: description, comparison and development.

Description. Description is the communication of specific programmatic features of any instruction that is currently designed to individualize the instruction.

Comparisons. Comparison is the communication of both the on-going program and the ideal program that is envisioned. This ideal program may be a long-range goal of a faculty or the written intent of the developer of a packaged program.

Development. Development is to serve as an aid to the processes included in developing an individualized instructional program. This may be making a faculty aware of specific instructional features which may be addressed within an individualized program as well as communicating the specific goals and practices of the faculty.

Each of these three uses of the Descriptor was tried with different instructional programs in the fields of mathematics, reading and teacher education (see diagram 1, section III).

Descriptive Use of the Descriptor

The Descriptor proved to be useful and efficient for providing a thorough understanding of programs that were designed to individualize the instruction. With one or two days of interview and observation time, one or two staff members visited a functioning instructional program and left with a clear picture of the processes being used to achieve that version of individualized instruction. The Descriptor (including the supportive secondary sheets) was used both as an outline for interview questions and classroom observations and a recording system for data. As an outline and guide, the Descriptor proved to be a very efficient communication device, both to the faculty members who were describing their program and to the visiting WCAII staff member (or members) who were initially unfamiliar with the program being described. Not only did the visiting WCAII staff member leave with a clear understanding of the program but the faculties visited often reported that the Descriptor helped them more clearly communicate and organize in their own mind the nature of their own program.

The WCAII staff found the Descriptor useful for gathering information and describing current attempts at individualizing instruction. Both the Descriptor and the interviewing process through which a program was described on the Descriptor proved efficient and capable in communicating specific features of each individualized program that was used in the field testing procedures.

This efficiency in the communication of specific features of individualized instructional programs suggests that the Descriptor may be helpful in:

* introducing a program to a new teacher.

* introducing a program to parents at a PTA meeting.

* introducing a program to students.

* introducing features of a program to potential users.

* sharing the individual perceptions of the goals of a program with fellow team members.

* sharing certain features of a program of one team with members of another team.

* sharing the different kinds of instructional programs that are available within a school district.

* sharing the views of parents of the type of instructional program that they want for their children.

Comparison Use of the Descriptor

The interviewing technique and the guidance provided by the Descriptor proved especially helpful to those faculty members who were attempting to describe their own image of an ideal individualized instructional program. The specificity of the terminology and the range of the operational features portrayed on the Descriptor seemed to challenge and stimulate the imagination of those faculty members being interviewed. As has been stated before, no program visited was considered by its faculty members as being fully developed or functioning to the extent that they wanted. It seemed to be very natural for faculty members to say that their individualized program was not yet fully developed: that there were features in their functioning program which were expected to be changed in the future. In identifying these features, the terminology and specificity of the Descriptor proved very helpful. Since it was the operational aspects of a program that were characteristically seen as

needing improvement and redesign, the focus of the Descriptor was appropriate for describing the projected features of a faculty's ideal program.

The Descriptor was also used to describe the written intents of the developers of certain packaged materials. Although the Descriptor efficiently reported the developers intent, these descriptions were often lacking in clarity. The reason for this is that many important features of an individualized program were not addressed in the developer's statements. For example, seldom were specifically stated the percent of time suggested for various groupings, the percent of time spent with different kinds of media or the teacher's use of recorded information in these statements. There were often several references to "independent study", "instruction through manipulation" or "diagnosis and prescription" but these were far more general than those received directly from faculty members being interviewed with regard to functioning or intended on-site programs.

One suggestion from the staff's experience with these written statements by developers of packaged programs is that the Descriptor could prove useful in communicating the intent of specific packaged programs to teachers and other educators. The verbal statements could have used a more concise description of the materials and a more precise explanation of how the materials can be used within classrooms.

The possibility for comparison that is provided by the graphic representation of different programs or different perceptions of the same program on the Descriptor suggest that the Descriptor may be helpful in:

* comparing the current program of an instructional team with the program that they would like to have functioning in the future.

* comparing the strategies being used in programs for different subject matter areas.

* comparing the strategies being used in programs in different grade levels.

* comparing different packaged materials in a subject matter area.

* comparing certain program features of different programs with observed results.

* comparing the instructors' views of a program with the views of the students.

Development Use of the Descriptor

The specificity and clarity of the terminology and form of the Descriptor proved very helpful to those faculties who used the Descriptor in developing their own techniques towards individualizing instruction. The variety of the three situations in which the Descriptor was used to help further the development of individualization suggested that the Descriptor could be useful to faculties attempting to develop an individualized focus to their instructional programs. The members of one staff, for example, used the Descriptor as they were just beginning to formulate their instructional goals and the strategies needed to implement their goals in an instructional program. This staff reported that the Descriptor aided interstaff communication of certain goals of their program and also suggested specific features of their program which could be developed at specified times. Another staff used the Descriptor to further delineate its own problems in developing a inter-related individualized program using two different packaged sources. This staff found that the Descriptor helped identify those management features that needed to be developed further in order to achieve its goals. A third staff used the Descriptor to identify already completed features of its individualized instructional program to other staffs. This staff found that the Descriptor was the most complete way to efficiently disseminate information about the completed and functioning program.

Thus, the Descriptor was used for different developmental functions, from the identification of problems to address to the dissemination of an on-going program. In fact, as has been stated before, the staffs of all the programs visited suggested that they intended to use the Descriptor for purposes related to the continued development of their programs.

The clarity and comparative qualities of the Descriptor suggest that the Descriptor can be especially helpful to a staff that is developing an individualized instructional program. Following are some situations included in the developmental process where the Descriptor may be especially useful.

* When a staff wishes to set the ideal program or goal towards which it wants to aim its efforts, the Descriptor would be useful in recording that ideal program.

* When a staff wants to set up developmental stages (i.e., a specific time schedule for the completion of certain programmatic features), the Descriptor can be used to describe each developmental stage.

* When a staff wants to look at the progress made in developing a program, two Descriptors can be used to compare the features of the current program with the program as it was at a certain time in the past.

* When a staff wants to compare the development of a program with the projected schedule that had been set up, the Descriptor can be used to compare the original plan with the actual program at that time.

* When a staff wants to communicate the progress made in the development of a program, a number of Descriptors can be used to show the successive stages of development.

* When a staff wants to analyze the cost for making certain developmental changes in the program, the Descriptor can be used to identify those features that will be developed and included in the cost analysis study.

* When a staff wants to analyze the progress made in a school year, one Descriptor can be used at the beginning of the year, one Descriptor can be used at the end of the year and the two Descriptors can then be compared to identify those programmatic features that have changed in that time.

APPLICABILITY OF THE DESCRIPTOR TO DIFFERENT SUBJECT AREAS

Although the Descriptor was initially prepared for use in mathematics, its revisions in subsequent editions were made to facilitate instruction in both reading and in teacher education. These areas along with mathematics provide the context for the field test. It remains to be seen how much of the Descriptor has application beyond these areas even though it has proven at times to be useful in discussing with persons interested in social studies and science as well as physical education and the arts, the nature of individualizing instruction in their respective programs.

The Use of the Descriptor for Mathematics Programs

There were a wide variety of mathematics programs visited and described. These programs ranged from elementary school to high school mathematics, from single classrooms to extensively developed commercial programs to locally designed mathematics learning centers. In all of these programs, the Descriptor was used comfortably and efficiently. The terminology and programmatic features included on the Descriptor proved capable of describing the instructional features of different kinds of mathematical programs designed to individualize the instruction in different kinds of settings.

The Use of the Descriptor for Reading Programs

All the reading programs visited and described on the Descriptor were elementary school reading programs. The settings ranged from single classrooms to team teaching situations and from the use of commercially packaged programs to programs designed by one teacher. It was found that reading for most of these schools was not identified or designed as one program. For instance, there was frequently one basic strategy for the teaching of specific reading skills, another strategy for the teaching of reading competencies and a third strategy used for reading enrichment. Some programs visited devoted about equal time to these three different aims in reading. Thus, for these programs, the Descriptor was a composite picture of three different strategies being used in one "reading program." Often the media and groupings used, the sequence and determination of rate and objectives were different for the development of reading skills and reading comprehension within one reading program.

Future users of the Descriptor may want to include separate descriptions of the different areas which are included by a staff in its

reading program. Although the composite picture proved helpful for some purposes, the faculties interviewed expressed a desire to also have each aspect of their reading program (e.g., comprehension, reading skills, reading enjoyment) described separately.

The Use of the Descriptor for Teacher Education

The programs visited that were designed to individualize the instruction of student teachers were university institutions that were attempting some form of "competency based teacher education." These programs were considered as either a prototypic course or a series of prototypic courses which were being designed to implement an instructional program that addressed certain features of student teaching competencies. Each of the faculties visited appreciated the usefulness of the Descriptor to the continued development, evaluation or dissemination of their programs.

In order to make the Descriptor applicable to teacher education, the WCAII staff did have to make some decisions about the terminology and restrictions that were not necessary for either mathematics or reading programs. One decision, for example, was about how to classify and describe the student-teaching "practicum" that is included in the education of a student-teacher. This classification was a special problem in the Media and Grouping components. It was decided that it was best to limit the description of a program attempting to "individualize" the education of student-teachers to those features of the instruction which were based at the university institution or to limit the description to a portion of the teacher education program which had a single focus toward which the Descriptor could be directed.

The education of student teachers takes place at two different settings: the University and the school in the community. The WCAII staff focused upon the University.

The Descriptor does describe those features of an individualized teacher education program that are found within the institution itself, and can be expected to be useful in communicating the programmatic features that must be addressed when individualizing teacher education.

DATA GATHERING TECHNIQUES

One of the most beneficial features of the Descriptor is the methodology and process used to gather the information about each individualized instructional program. This process has been referred to as an "interview" but it may be clearly described as a joint descriptive task that included both the interviewer and the faculty members being visited.

After sitting down with a faculty member (or a small group of faculty members) the general purpose of the Descriptor was described as well as a short introduction to each of the ten components of the Descriptor. After this general introduction, each component was addressed specifically. The terminology of each component was described in detail and examples were shown of some of the possible pictorial representations for different programs. Questions were then addressed to the faculty member (or members) about how that particular program would best be described. At this point, the terminology and form of each component often forced the faculty members to be very specific about certain aspects of their functioning program. This process, taking component by component, proved to be demanding and extensive in gathering information about complex approaches to individualizing instruction.

Often instructional materials, management forms and the daily classroom operation itself would be shown to the visiting interviewer. These provided the interviewer with perceptions of the program that enabled the interviewer to ask questions and identify answers in the same terminology used by the visited personnel.

The process of this interview or joint task technique seemed to be very satisfactory to the faculty members being visited. The demands that this process made upon the faculty members' image of their own program seemed to be as beneficial for them as it was for the WCAII staff.

LIMITATIONS OF THE DESCRIPTOR

Certain cautions must be undertaken by the users of the Descriptor for Individualized Instruction. It is very important that the users of this Descriptor realize that it is not designed to describe the entire range of possible instructional programs. Following are three cautions which have been impressed upon the WCAII staff in using the Descriptor in over thirty different situations throughout the United States.

Caution 1. *Use the Descriptor to represent only those kinds of programs for which it was designed.*

The Descriptor is designed to describe specific features of programs that are individualizing the instruction in order to increase the possibility that every student will be able to learn certain identified skills. The programmatic features that are described include the variety of materials used for instruction, the groupings used, the variability in the sequencing of units, the variation of rate of progress, the range of program objectives, evaluation techniques and system(s) for recording and using recorded information for program decisions. This perspective represented by the Descriptor has been found to be valuable in describing many current and ideal programs for individualized instruction.

There are some programs, however, for which the Descriptor is not designed and for which the perspective may be inappropriate. First, it is designed only for individualized instructional programs. It is not to be used for other kinds of interesting, traditional or innovative instructional programs. Applicability of the Descriptor to aspects of an activity-based instructional program or a program operated on the Summerhill concept has not been thoroughly explored. There are parts of the Descriptor which respond better than others to such programs.

Caution 2. *Use the Descriptor to describe only a specific instructional program.*

The Descriptor is designed to describe one specific individualized instructional program at a time. It is not an instrument for describing many programs in one representation. For example, the Descriptor should not be used to describe the entire instructional program of a school system, a school, a team or even of a single classroom. The Descriptor does not average well across different programs. The specificity of the

component terminology (e.g., "percent of instructional time") would be used erroneously and, possibly, dishonestly if the Descriptor were used to describe many different programs at once. A photograph of the view outside of my window is one view of Madison, Wisconsin. If I wanted to show more views of Madison, Wisconsin, I would not take many different photographs, average them and make one composite "picture" of Madison. So, too, if one wanted to show a view of an overall instructional program (for example, the general program of a school or school system), a composite picture would be at least misleading and probably without meaning. The suggestion of the WCAII staff is that if the variety of available programs were to be described, a number of Descriptors should be used to show a number of specific programs. Just as a better way of showing Madison, Wisconsin is through a number of sample photographic views, so, too, the better way of showing a general education program is by showing a number of views of specific sample programs.

Caution 3. *Do not use the Descriptor as an evaluation instrument unless the standard that is being applied is the staff's own ideal program.*

An evaluation instrument needs standards and there are no such standards included within this Descriptor. As has been stated, the Descriptor is designed to describe certain features of instructional programs: either a functioning program or a staff's ideal version of a program. The Descriptor is an evaluative instrument only to the extent that a staff wishes to analyze its own program with its own ideal for a program. Certainly, the Descriptor does represent some perceptions of features that different individualized instructional programs might contain. It is the opinion here, however, that there will never be one single "individualized" instructional program that will satisfy the ideals of all educators. One purpose of this Descriptor is for a staff to be able to say, this is what we have now, but is this what we want to have in the future?

VII. FINAL EDITION OF THE DESCRIPTOR

INTRODUCTION

From the experiences that the WCAII staff had with the Descriptor during the field tests, modifications were suggested for the final form of the Descriptor. These modifications were made in order to clarify and simplify some of the terminology and organization of the Descriptor. Although the form and the terminology of the Descriptor used in the field tests were familiar to the staff, some revisions would clarify the Descriptor for educators who would be using the Descriptor without the WCAII staff.

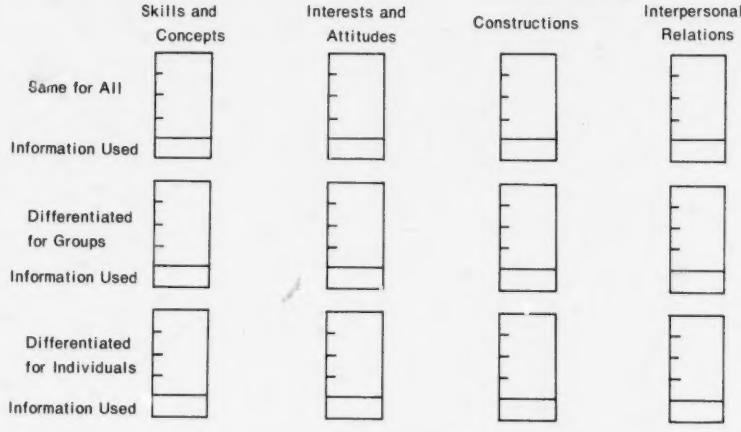
Staff meetings were held to discuss the problems encountered with the terminology and form of the Descriptor and proposals for modifications were analyzed and considered. Included in these considerations was a decision to make the Descriptor capable of being used without more detailed, supporting secondary sheets. The secondary sheets had proved cumbersome to use in the interview, joint-description sessions and, thus, were not found to be entirely useful in their present form. Direct questions from the secondary sheets are being designed to be put into a branched computer program. This task, however, is still in the preliminary phase. It was not feasible to invest resources in this data gathering technique at this time.

The final form of the Descriptor is the culmination of two years of planning and informal field testing by university graduate school seminar members and members of the WCAII staff, many meetings with consultants and finally six months of field testing in a variety of sites throughout the United States. This final form of the Descriptor is shown in Figure VI. 1. The User's Manual includes the definitions and explanations of the terminology used as well as a description of the procedures for using the Descriptor. It is with some pride that the WCAII staff presents this final form of the Descriptor for other educators to use in describing their own attempts at individualizing instructional programs.

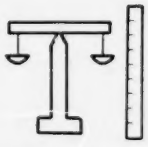
Descriptor for

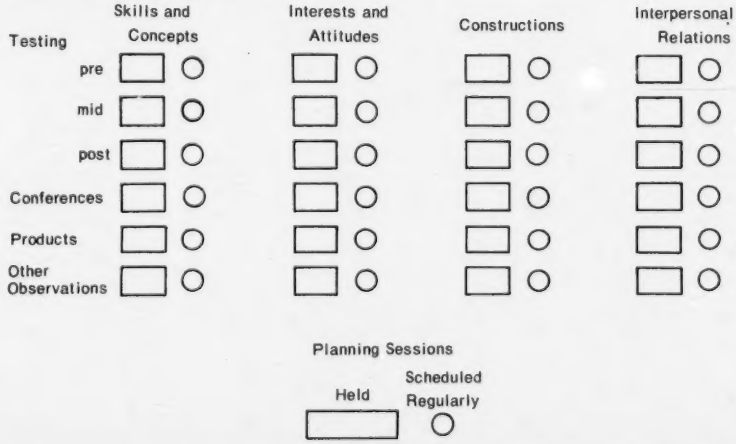
AIMS

OBJECTIVES



LEARNER ASSESSMENT PROCEDURES





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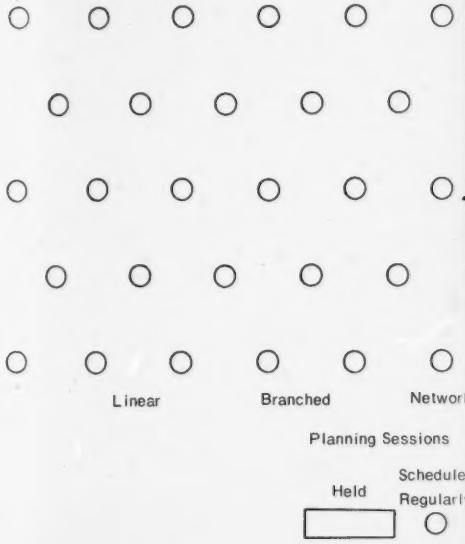
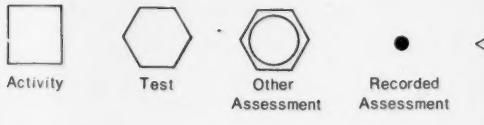
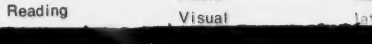


PROGRAM PATTE



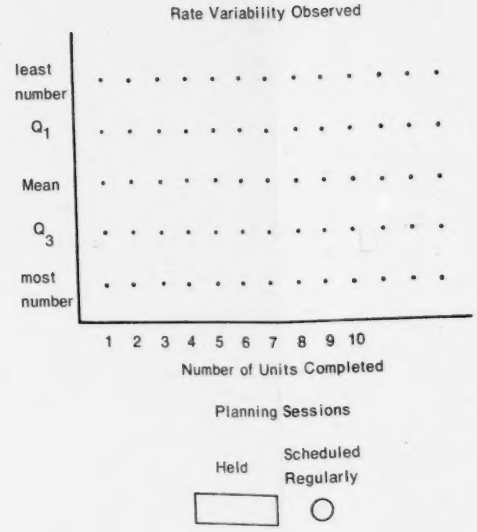
MEDIA



or Individualized Instruc

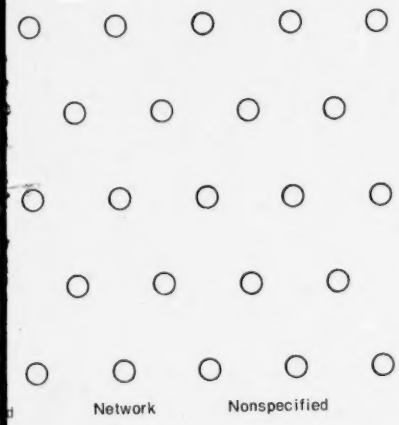
INSTRUCTION

RATE



Planning Sessions

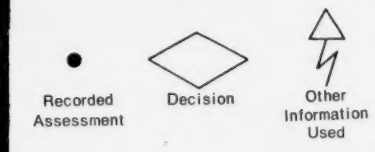
Held | Scheduled Regularly



anning Sessions

Held | Scheduled Regularly

PATTERN



MA

RECORD INFORMA

Learner As

Storage Form	Skills & Concepts	Attitudes & Interests
computer	○	○
record file	○	○
portfolio	○	○
other	○	○

USE OF INFORM

Who Uses the Recorded Information

GROUPING

Manipulative Materials	No Media	Self	Grouped Without Instructor				Grouped With Instructor			
		alone	peer tutor	sm. gp.	md. gp.	lg. gp.	alone	sm. gp.	md. gp.	lg. gp.

COLOR KEY

Learner determined

zed Instruction

Variability Observed

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

6 7 8 9 10

er of Units Completed

lanning Sessions

eld Scheduled Regularly

MANAGEMENT

RECORD OF INFORMATION

Information About Learners

Learner Assessment: Skills & Concepts; Attitudes & Interests; Construction Making; Interpersonal Relating

Learner Use of Program Options: Objectives; Assessment; Sequence; Rate; Media; Grouping

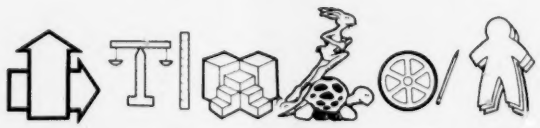
Information About Program

Instructors: Content Interest; Teaching Style Preference

Option Availability: Objectives; Assessment; Sequence; Rate; Media; Grouping

Storage Form	Skills & Concepts	Attitudes & Interests	Construction Making	Interpersonal Relating	Objectives	Assessment	Sequence	Rate	Media	Grouping	Content Interest	Teaching Style Preference	Objectives	Assessment	Sequence	Rate	Media	Grouping
computer	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
record file	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
portfolio	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
other	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

USE OF INFORMATION



Who Uses the Recorded Information

G

Grouped Without Instructor

Grouped With Instructor

tor gp. gp. gp.

one gp. gp. gp.

COLOR KEY

Decision Making

- Learner determined
- Instructor determined
- Program determined

Other Descriptive Features

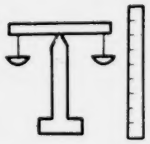
OBJECTIVES

	Skills and Concepts	Interests and Attitudes	Constructions	Interpersonal Relations
Same for All				
Information Used				
Differentiated for Groups				
Information Used				
Differentiated for Individuals				
Information Used				

Planning Sessions

Held ☐ Scheduled Regularly ○

LEARNER ASSESSMENT PROCEDURES



Testing	Skills and Concepts	Interests and Attitudes	Constructions	Interpersonal Relations
pre	☐ ○	☐ ○	☐ ○	☐ ○
mid	☐ ○	☐ ○	☐ ○	☐ ○
post	☐ ○	☐ ○	☐ ○	☐ ○
Conferences	☐ ○	☐ ○	☐ ○	☐ ○
Products	☐ ○	☐ ○	☐ ○	☐ ○
Other Observations	☐ ○	☐ ○	☐ ○	☐ ○

Planning Sessions

Held ☐ Scheduled Regularly ○

PROGRAM CONTEXT

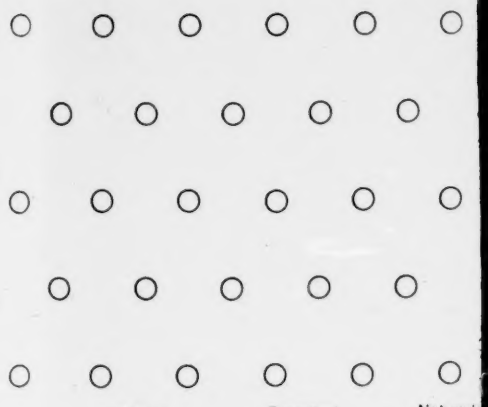
Functioning Program ☐ Ideal Program ☐

PROGRAM CHARACTERISTICS

Subject Matter	mathematics	reading	teacher education	
Grade Equivalents	P K 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16			
Production Agency	local schools	educational agency	commercial agency	
Packaging	modules	text	multi–texts	tests
Learner Arrangement	alone	fixed groups	changing groups	
Learner Time	unscheduled	scheduled/fixed	scheduled/flexible	
Space Arrangement	open	multiple rooms	single room	
Staff Arrangement	teacher	teacher group	specialist(s)	aide(s)

SOURCE OF DATA

- Instructor
- Learners
- Administrators/ Supervisors
- Developers
- Materials
- Other



Linear Branched Network

Planning Sessions

Held ☐ Scheduled Regularly ○

PROGRAM PATTE

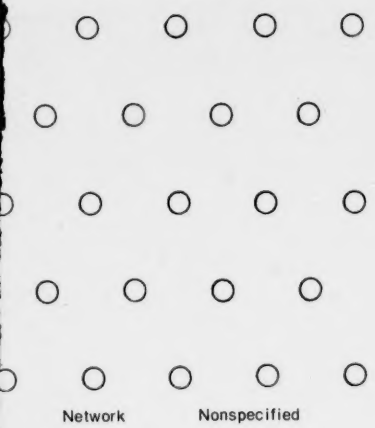
Activity ☐ Test ⬡ Other Assessment ⯃ Recorded Assessment •

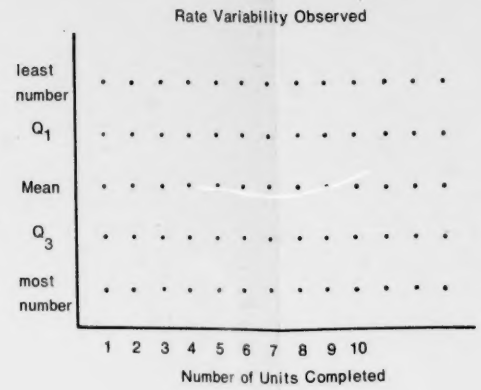
MEDIA

	Reading Materials	Audio–Visual Materials	Man… lativ… Mate…
Percent of Instructional Time	7 6 5 4 3 2 1 Variety	7 6 5 4 3 2 1 Variety	
Who Determines	☐	☐	
Information Used	☐	☐	

Planning Sessions

Held ☐ Scheduled Regularly ○





ning Sessions
Held
Scheduled Regularly

Planning Sessions
Held
Scheduled Regularly

ATTERN

Recorded Assessment

Decision

Other Information Used

RECORD INFORMA

Learner As

Storage Form	Skills & Concepts	Attitudes & Interests
computer	○	○
record file	○	○
portfolio	○	○
other	○	○

USE OF INFORMA

Who Uses the Recorded Information

COLOR KEY

Learner determined

GROUPING

Manipu-lative Materials

No Media

Variety

Self

Grouped Without Instructor

Grouped With Instructor

alone

peer tutor

sm. gp.

md. gp.

lg. gp.

Percent of Instructional Time

Who Determines Information Used

ning Sessions
Scheduled Regularly

Planning Sessions
Held
Scheduled Regularly

ity Observed

7 8 9 10
Units Completed

ing Sessions

Scheduled
Regularly

RECORD OF INFORMATION

Information About Learners

Learner Assessment

Learner Use of Program Options

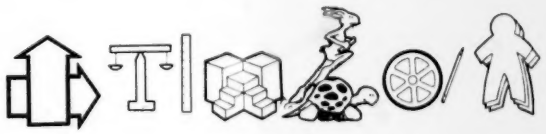
Information About Program

Instructors

Option Availability

Storage Form	Skills & Concepts	Attitudes & Interests	Construction Making	Interpersonal Relating	Objectives	Assessment	Sequence	Rate	Media	Grouping	Content Interest	Teaching Style Preference	Objectives	Assessment	Sequence	Rate	Media	Grouping
computer	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
record file	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
portfolio	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
other	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

USE OF INFORMATION



Who Uses the Recorded Information

Grouped
Without Instructor

tutor | sm. gp. | md. gp. | lg. gp.

Grouped
With Instructor

alone | sm. gp. | md. gp. | lg. gp.

Planning Sessions

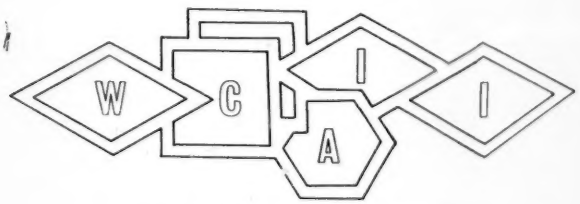
Held | Scheduled Regularly

COLOR KEY

Decision Making

- Learner determined
- Instructor determined
- Program determined

Other Descriptive Features



WISCONSIN CENTER FOR THE ANALYSIS
OF INDIVIDUALIZED INSTRUCTION

School of Education
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VIII. APPENDICES

APPENDIX A

BIBLIOGRAPHY ON INDIVIDUALIZED INSTRUCTION

The extensive and growing interest in individualized instruction has generated considerable literature on a variety of topics related to individualization. In turn, much of this literature has been catalogued in bibliographic essays or collections. Because existing bibliographies have been prepared with special objectives in mind or from particular orientations, however, there is surprisingly little duplication of entries across bibliograhies.

In the process of developing the Descriptor during the present project, much of the professional literature was consulted. Because the WCAII staff was working from a unique perspective, the references which proved helpful in the course of the project were in many cases different from those cited in earlier bibliographies. Therefore it seems useful to provide our own bibliography to add to those already in existence. Some of the references cited here offered basic philosophical or practical guidance to our efforts while others were only consulted briefly. Though no references are singled out for special mention, the bibliographic entries have been grouped by topics to assist a user in identifying those most germane to his own interests. Several entries have been listed under more than one heading.

The headings are:

Bibliographies. These collections of references all relate in some way to individualized instruction. They may be viewed as a starting point for a very comprehensive survey of individualized instruction. None of these collections parallels the one presented here.

Individual Differences Examined in Learning Theory and Educational Practice. These discussions consider the psychological and pragmatic bases for differentiation of instruction for individual learners. These references contributed to the delineation of the philosophical stance held by the WCAII staff.

Aspects of Individualized Instruction. These sources explore one or more features of instruction which might be considered in attempting to individualize. They were examined in the process of formulating a list of aspects of individualization which the WCAII staff consider essential in describing instruction. Component titles from the final Descriptor are used to group entries:

Objectives
Assessment
Sequence
Rate
Media
Grouping
Management
Decision Making

Taxonomies Describing Individualization Procedures. These references offer systematic conceptualizations of the factors contributing to individualized instruction and their interrelationships. They may be considered to be earlier examples of the type of unified conceptualization attempted by the researchers in developing the Descriptor.

Individualized Instructional Programs. This category includes anecdotal accounts or reports of operating individualized instructional programs. Several entries here identify sites with individualized programs. This section provides guidance to those seeking descriptions of local operating programs in a variety of subject matter areas.

Evaluation of Individualized Programs. Techniques, methodologies, or research studies which have as a focus the evaluation of the effectiveness of individualized instruction are identified here. While the present project did not explicitly consider evaluation, these references provide a limited background for examining the particular problems associated with evaluating individualized programs.

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APPENDIX B

BIBLIOGRAPHY ON OBSERVATION TECHNIQUES

A variety of methods for gathering necessary data were considered and tried during the course of the project. Particular attention was given to the many systems of direct observation of behavior which have been devised as research instruments. Although direct observation did not prove to be the most satisfactory method of obtaining data on individualized programs, references related to the subject were useful in identifying feasible modes of observation, the results which could be expected and the uses to which data could be applied. Therefore the consulted references are included here.

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